

December 1959



Soo Line 'streamlines' cuts

p. 19

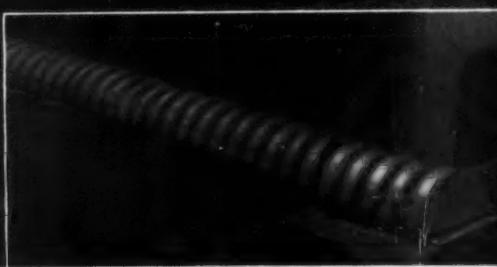
way **TRACK** and

STRUCTURES

half-circle
deck drains
for long bridge

p. 28

Simmons-Boardman TIME-SAVER Publication





ONE DOSAGE of
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for ALL-YEAR WEED CONTROL

Low dosage — usually a small fraction of that of other "apply dry" formulations — is a big advantage you get with H-174. And it's easily explained: Nalco H-174 has an unusually high concentration of powerful killing ingredient. You get much more killing power with much less chemical to transport and apply!

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Spreading *dry*, granular Nalco H-174 is a fast, simple operation. No mixing, spraying, or dilution . . . ready to use as it comes from bag or convenient shaker box . . . distribute by hand or with mechanical spreaders . . . For better weed control, plan on using Nalco H-174!

H-174 is one of a complete line of Nalco weed control chemicals, both dry and liquid, in wide use by railroads and industries throughout the world.



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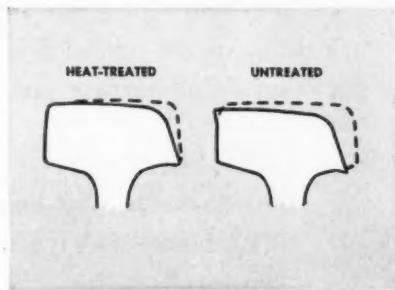


Drawing a rail-head's portrait... ...to measure the longer wear of heat-treated rails

This unique device is Bethlehem's rail contour machine, which enables our metallurgical engineers to draw an accurate, full-size "portrait" of a rail-head. These portraits are essential in studying the comparative wear of treated versus untreated rail.

The tracings shown here were taken from actual test sections of a northwestern road. From these drawings it is easy to see that the Bethlehem heat-treated rail is performing about twice as effectively as the untreated rail. Similar studies conducted on other railroads have produced even more favorable results.

You have a real cost-cutting opportunity in heat-treated rail. A Bethlehem engineer will be glad to show you our files of case histories. He'll also help you pick a suitable test location if you wish. Just get in touch with the nearest Bethlehem office.

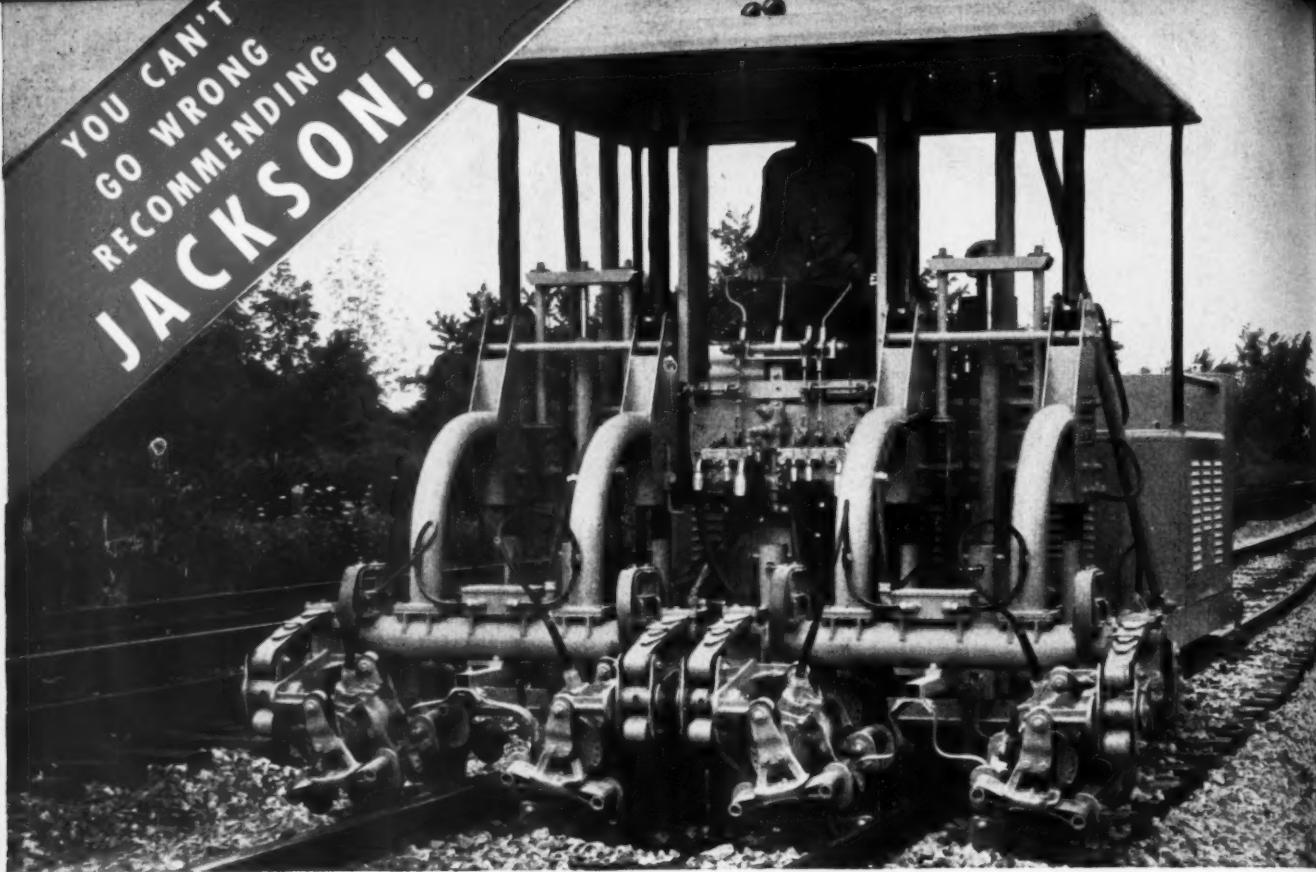


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BETHLEHEM STEEL



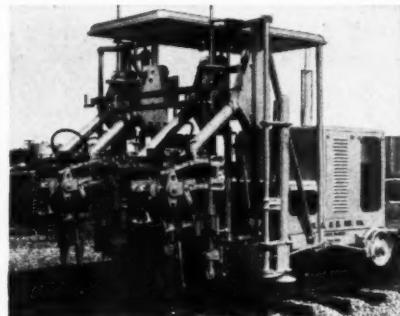
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THE 1960 JACKSON TRACK MAINTAINER: Faster and better than its predecessors though those machines won an endorsement by leading track men such as no other in this category has ever enjoyed . . . purchase and use on nearly all the major systems in America. For the dual purpose of putting up and maintaining track of finest, longest-lasting quality at minimum cost, it is demonstrably the finest money will buy.

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TAMPER: A product of intensive research, development and testing with all operations electrically controlled and push-button operated. It's an exceedingly fast Jack Tamper, adapted to existing track surfacing equipment; a mighty powerful, efficient spot tamper and ideal as an all-around production tamper for those requiring an all-purpose jacking-and-tamping machine.



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RAILWAY TRACK and STRUCTURES

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This road aims to ease snow troubles by cutting back the slopes of cuts on many territories. Has already moved six million cubic yards.	
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Yes, say speakers at RTA convention. They recommend standardization, wider use of hardwoods other than oak, changes in tie-buying practices.	
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◀ Don't miss . . .

Here's the complete story of how the Baltimore & Ohio "is getting set for the Sixties." We'll take an entire issue to tell what it's doing to modernize its properties, streamline its M/W operations, prepare for the future.

. . . in the January issue

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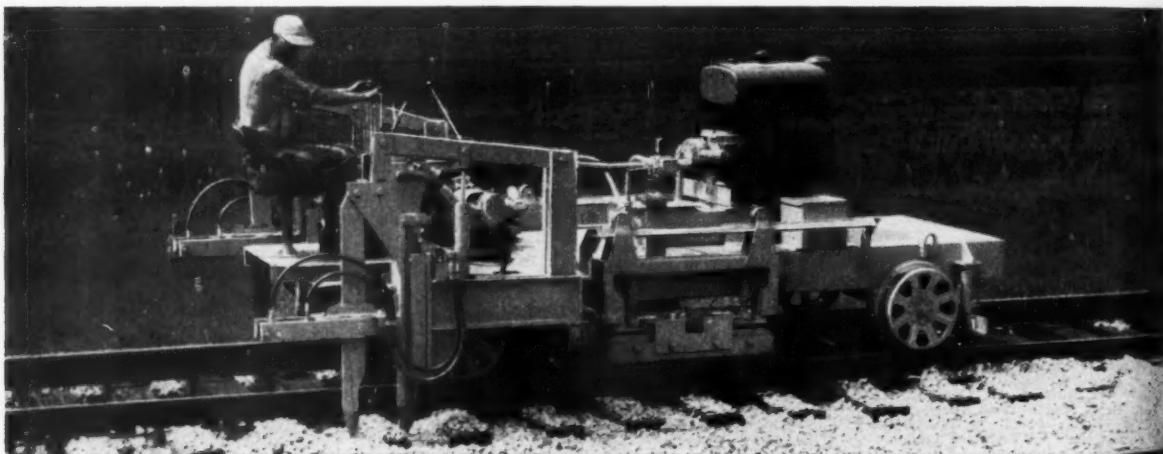
TAMPING, TIE SPACING, TRACK RAISING, RAIL CHANGE OUT... **SPECIFY PULLMAN-STANDARD** TRACK MAINTENANCE EQUIPMENT

Make sure that your recommended expenditures for 1960 track maintenance programs include the newest, most advanced types of mechanized equipment available. And be sure that any new equipment your railroad plans to purchase or lease will handle their specific jobs as efficiently and economically as possible.

If you have not done so already, look into the complete line-up of Pullman-Standard Track Maintenance Equipment for 1960. Here is equipment that has been designed, service tested and proved on America's leading railroads. Here are machines that will perform not only major track maintenance jobs but also everyday assignments

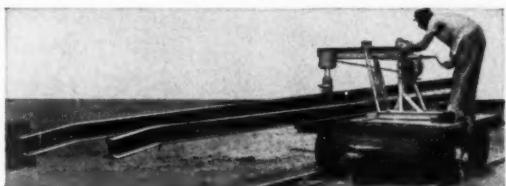
such as rail change out. And they can perform them faster, better, and at lower cost than other types of competitive equipment.

To find out how Pullman-Standard Track Maintenance Equipment can economically fit into your 1960 equipment budget, contact the Authorized P-S Track Equipment Representative in your area. Or, if you prefer, write direct to our Track Equipment Department. Our Track Equipment Sales & Service Engineers are anxious to meet with you. They will be pleased to talk over your mechanized track maintenance equipment requirements and needs and, if you desire, explain our convenient leasing arrangements.



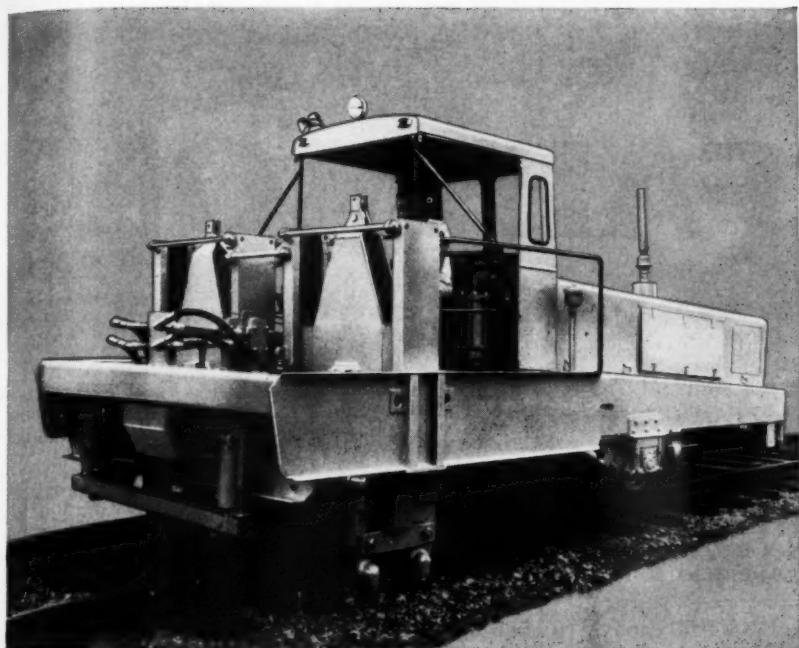
P-S POWER TIE SPACER—The P-S Power Tie Spacer performs all tie-positioning jobs . . . features unlimited tie movement, top operator visibility, and a working speed that sets a fast pace for related operations. Here is a tie spacer that can keep up with an undertrack plow, squares ties automatically, and won't hump track. The P-S Power Tie Spacer is of heavy-duty construction to insure a longer life. Maintenance is quick and easy. Travel speed in forward or reverse is 25 mph. For set-off, hydraulic lift jacks raise machine off rails; lateral set-off wheels carry machine off track and clears it for traffic in minutes.

P-S RAIL HANDLER—The P-S Rail Handler is a lightweight but powerful, portable, hand operated crane. It can be used with any standard push car and no special mountings are required. One man can easily unload a 39 foot section of any size rail onto or off a push car with this handy machine . . . a two man section gang can quickly and efficiently make rail or switch point change outs. This and numerous other jobs can now be performed in less time than before because of the simplicity and portability of this hand-operated crane.



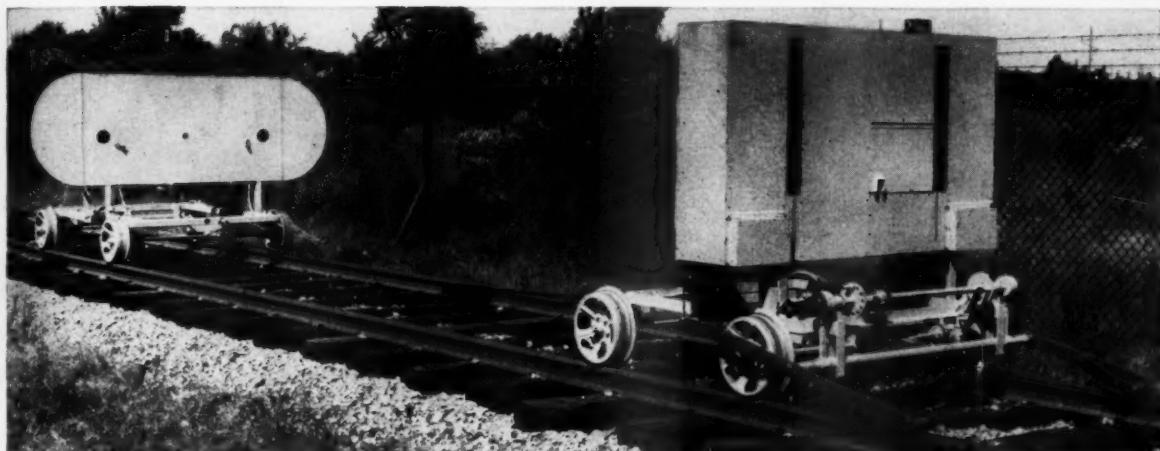
P-S POWER CLEANER AND WINCH CAR—Both track shoulders or one shoulder and half the six-foot can be cleaned simultaneously to a depth of 8 to 10 inches below the tie base at a rate of 1000 to 1200 feet per hour. Fast clearing and mobility permits a four-man section gang to efficiently and economically clean track even under traffic.





P-S POWER BALLASTER—The P-S Power Ballaster features "squeeze" action tamping that firmly compacts ballast in the critical load bearing area under the rail, minimizes track settlement and increases track life. Independently operating crossheads put eight tamping tools to work at each tie-rail junction. The P-S Ballaster has controllable tamping depth to meet all types of ballast and raise conditions. With the P-S Power Ballaster, track stays level, ballast stays compact longer. Maintenance costs are reduced to a minimum.

P-S ELECTRONIC TRACK RAISER—The P-S Electronic Track Raiser can be used for all types of track surfacing jobs—spot surfacing or out-of-face surfacing and it can be adapted to any make of jack tamper. Track is raised exactly as needed and where needed. Electronic eye seeks out all low spots . . . no guesswork . . . no misses. The P-S Electronic Track Raiser is completely automatic. No other unit can compare to it.



P-S POWER CRIBBER—The P-S Power Cribber requires only one operator to skeletonize two or more cribs a minute. Normal production rate is 150 to 300 track feet per hour. Interchangeable digger tips enable the P-S Power Cribber to crib efficiently and economically any type of ballast, regardless of degree of cementation. Designed with clearance requirements in mind, the P-S Power Cribber can be fully utilized along station platforms and tunnels.

For Detailed
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Equipment, Contact

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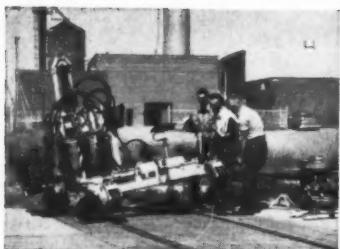
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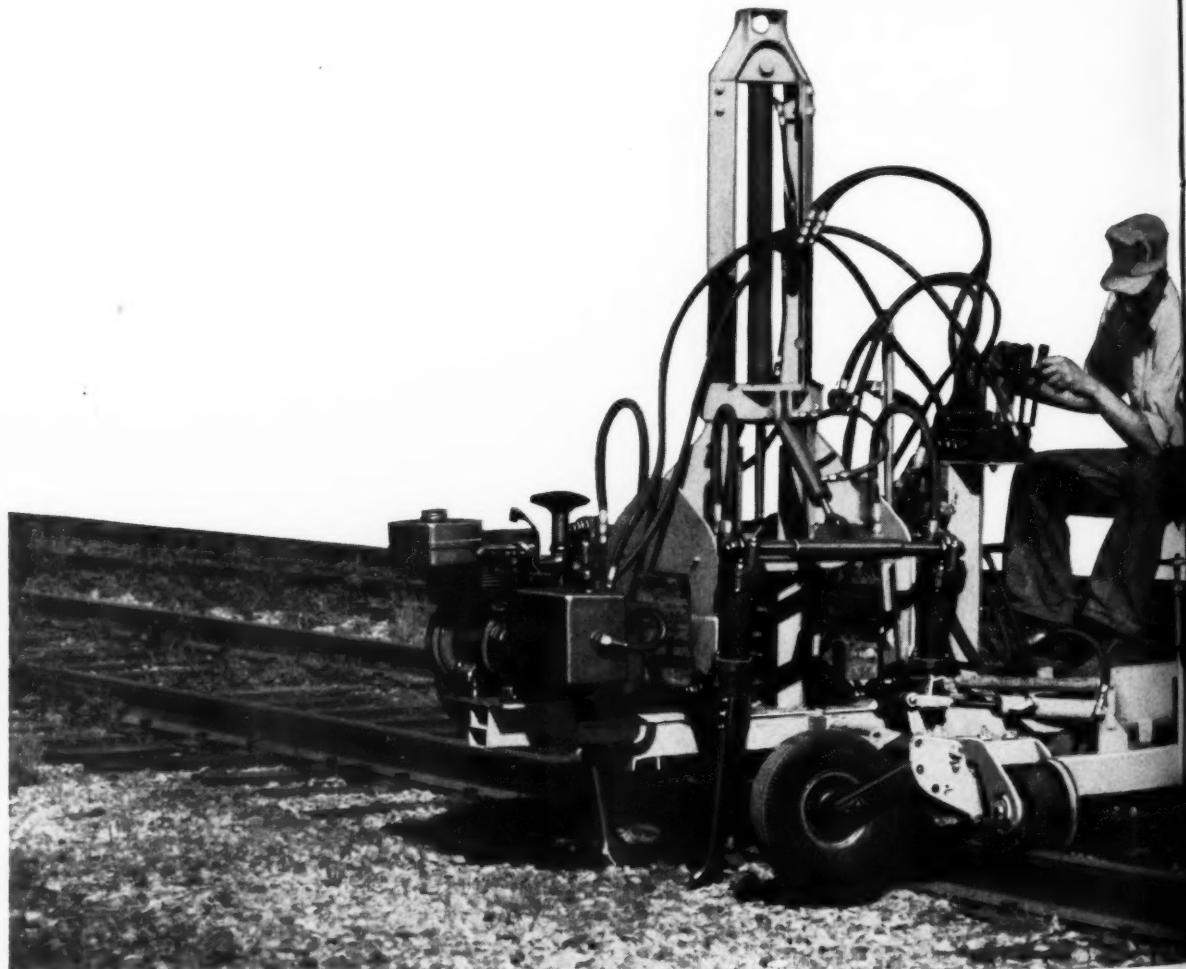
Now one man spot-tamps faster than four men

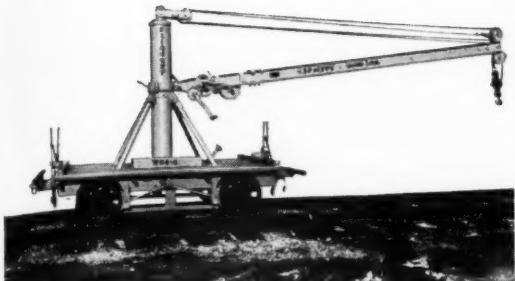
Here's how you can raise 25 to 30 rail joints an hour and still free three men of a four-man section gang for other jobs! The answer—a Fairmont W99 Series B Spot Tamper. One man rides in the center of the self-propelled W99 and hydraulically controls all four air tools to raise low spots, hanging ties and old joint locations at an average rate of 30 to 45 seconds per tie-end. The other men in the gang are free for jacking, sighting, loosening compacted ballast, and dressing.

The W99 is small and compact, yet powerful enough to penetrate hard, cemented ballast and sock the ties up to the rail. With its portable turntable and

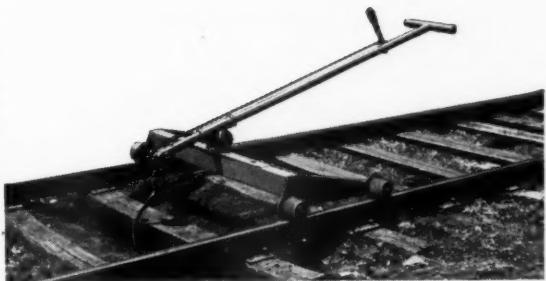
set-off, a foreman and two men can remove the W99 Spot Tamper from the track. And it's light enough to be transported to various locations in stake body and dump trucks.

The air-actuated guns turn on and off automatically as the tamping head is raised and lowered. The W99 has the vertical force for good penetration and a tilt arrangement for the hinged guns to crowd ballast under the ties. It comes equipped with a foot brake to prevent creeping when spotted over a tie, and a two-wheel drive for better tracking. The W99 is available with or without the tamping guns and compressor. Send for full information today.

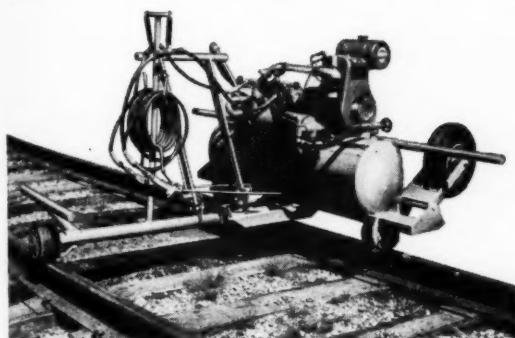




W64 SERIES A DERRICK CAR—One or two men can handle equipment up to 3000 lbs. Can be equipped with either a single or two-line power lift. 13-foot boom: 360° pivot.



W83 SERIES B TIE NIPPER—Simple lever and linkage open and close hooks for fast operation; long handle gives maximum leverage; long wheel base means good tracking.



W72 SERIES A OIL SPRAYER—Compact, efficient unit requiring only a small crew to apply oil to rail joints at a cost of only a few cents each. Easy to remove from track.



W71 SERIES A TIE SPRAYER—One man can apply heated protective coating to newly adzed tie surfaces when re-laying rail. Spray operation is automatic as the unit is pushed.

FAIRMONT RAILWAY MOTORS, INCORPORATED • FAIRMONT, MINNESOTA



ATLANTIC COAST LINE—**Irving M. Boone**, assistant engineer maintenance of way at Savannah, Ga., retired recently.

BOSTON & MAINE—**Thomas K. Dyer**, engineer maintenance of way at Boston, has been promoted to chief engineer there, succeeding **Foster R. Spofford** who has been promoted to assistant to vice president-operations, also at Boston. **Stanley G. Phillips**, vice president-engineering, at Boston, has retired after 43 years of railroad service.

BURLINGTON—**Bernard E. Cors**, trainmaster at Hannibal, Mo., has been promoted to assistant engineer of track at Galesburg, Ill., succeeding **M. G. Counter** whose death was announced in the October issue.

CHESAPEAKE & OHIO—The following retirements have occurred recently: **W. L. McClurg**, assistant valuation engineer at Detroit, Mich., after 29 years of service; **John T. Woodie**, supervisor bridge erection at Richmond, Va., after 43 years of service; and **Gordon Bestic**, supervisor track at Clifton Forge, Va., after 48 years of service.

J. A. Niehaus, assistant cost engineer at Raleigh, W. Va., has been promoted to assistant engineer at Ashland, Ky., succeeding **O. S. Green** who has been promoted to assistant trainmaster there.

ILLINOIS CENTRAL—**R. P. Ainslie**, instrumentman at Vicksburg, Miss., has been promoted to assistant to division engineer at Paducah, Ky., succeeding **W. W. Arnett** who has been promoted to project engineer, with headquarters at Paducah.

W. L. Hawkey, who has been on leave of absence due to illness, has returned to his position as supervisor bridges and buildings at Champaign, Ill., succeeding **Gordon G. Phillips** who has returned to his former position as supervisor track at Bloomington, Ind. Mr. Phillips succeeds **J. H. Stevens** who has returned to his former position as general foreman at Mattoon, Ill.

LOUISVILLE & NASHVILLE—**R. C. Young, Jr.**, division engineer at Birmingham, Ala., has been promoted to assistant engineer maintenance of way at Louisville, Ky.

MILWAUKEE—The following changes have occurred as a result of a reorganization of divisions, effective December 1:

R. D. Claborn, division engineer at Miles City, Mont., has been transferred to Deer Lodge, Mont., succeeding **R. W. Middleton** who has been appointed assistant engineer at Chicago.

J. E. Collings, chief carpenter at Miles City, has been transferred to Aberdeen, S.D., succeeding **L. C. Hirsch** who has been appointed assistant engineer at Savanna, Ill.

K. D. Natzel, roadmaster at Roundup, Mont., transferred to Miles City; **J. Spatafore**, roadmaster at Miles City, transferred to Tacoma, Wash.; and **T. A. Spatafore**, roadmaster at Three Forks, Mont., transferred to Harlowton, Mont.

MISSOURI PACIFIC — **L. L. Wallis**, general roadmaster construction at Kansas City, Mo., has been promoted to division engineer, Eastern division, there, succeeding **J. E. Martin** who has been transferred to the Terminal division, at the same location.

NEW YORK CENTRAL—**T. M. Scott**, assistant division engineer at Springfield, Mass., has been promoted to division engineer there, succeeding **E. M. Skelton** who has been transferred to the Syracuse division with headquarters at Rochester, N. Y. **C. A. Maxiner**, division engineer at Syracuse, N. Y., has retired after 43 years of service. **William Baerthlein**, assistant engineer at Buffalo, N. Y., has been promoted to district methods engineer at Syracuse. **H. E. Wall**, supervisor track at Collinwood, Ohio, has retired after 44 years of service.

NICKEL PLATE — **Ray F. Miller**, assistant bridge and building supervisor at Frankfort, Ind., has been promoted to bridge and building supervisor there, succeeding **Joe Hazelwood** who has retired after 45 years of service.

PENNSYLVANIA — **P. M. Rooper**, general manager, transportation, at Philadelphia, Pa., has been promoted to vice president-transportation and maintenance, succeeding **Allen J. Greenough** who has been elected president. Mr. Greenough succeeds **James M. Symes** who has been elected chairman of the board and chief executive officer. Both Mr. Greenough and Mr. Rooper are engineers by training and experience.

PITTSBURGH & LAKE ERIE—**J. J. Eash**, signal engineer at Pittsburgh, Pa., has been pro-

moted to assistant chief engineer there. The position of engineer maintenance of way has been abolished and the duties transferred to the assistant chief engineer.

ROCK ISLAND—**J. R. Begyn**, section foreman at Rock Island, Ill., has been promoted to acting track supervisor at Des Moines, Iowa, succeeding **W. L. Boothe** who has been promoted to acting roadmaster at Trenton, Mo. Mr. Boothe succeeds **Noble Hurt** who is on leave of absence due to illness.

Grady Davis, acting roadmaster at El Dorado, Ark., has been promoted to roadmaster at Kansas City, Kan., succeeding **F. H. Charles** who has been transferred to Liberal, Kan. Mr. Charles succeeds **J. R. Wright** who has been transferred to Fordeyce, Ark., succeeding **M. H. Bootjer**, retired. **V. Estes**, who has been on leave of absence due to illness, has returned to his position as roadmaster at El Dorado.

SANTA FE—**John R. Clayton**, chief clerk to operating vice president at Chicago, has been promoted to system valuation engineer there, succeeding **John W. Higgins** who has retired after more than 42 years of service. **George H. Turman**, track supervisor at Guthrie, Okla., retired recently after more than 40 years of service. **L. L. Mansfield**, assistant engineer at Galveston, Tex., retired recently after nearly 44 years of railroad service.

SEABOARD—**J. T. Rowe, Jr.**, has been appointed assistant to engineer of buildings at Richmond, Va., succeeding **S. B. Holt** who has been promoted to assistant engineer of buildings there. Mr. Holt succeeds **A. E. Lewis** who has been promoted to engineer of construction, also at Richmond, succeeding **L. N. Riggan** who has retired after 46 years of service.

SOUTHERN—**C. Michael Lumpkin**, track supervisor at Greenville, S. C., has been transferred to Salisbury, N. C., succeeding **Alvin E. Chambers** who has been promoted to assistant division engineer at Greenville. **Mel L. Loy**, track supervisor at Charlotte, N. C., has been promoted to rail supervisor, Eastern Lines, there. **Albert D. Perkins**, assistant to chief engineer at Birmingham, Ala., has retired after 32 years of service.

SOUTHERN PACIFIC—**V. P. Mahon** has been appointed roadmaster at Truckee, Cal. **Earl Bridgette**, senior assistant bridge and building supervisor at Los Angeles, retired recently after more than 37 years of service.

Obituary

Robert J. Gammie, 70, retired chief engineer of the Texas & Pacific, died October 19 at Dallas, Tex.

W. H. Hillis, retired senior vice president of the Chicago, Rock Island & Pacific, and an engineer by training and experience, died on September 9 at Phoenix, Ariz.



J. R. Clayton
Santa Fe



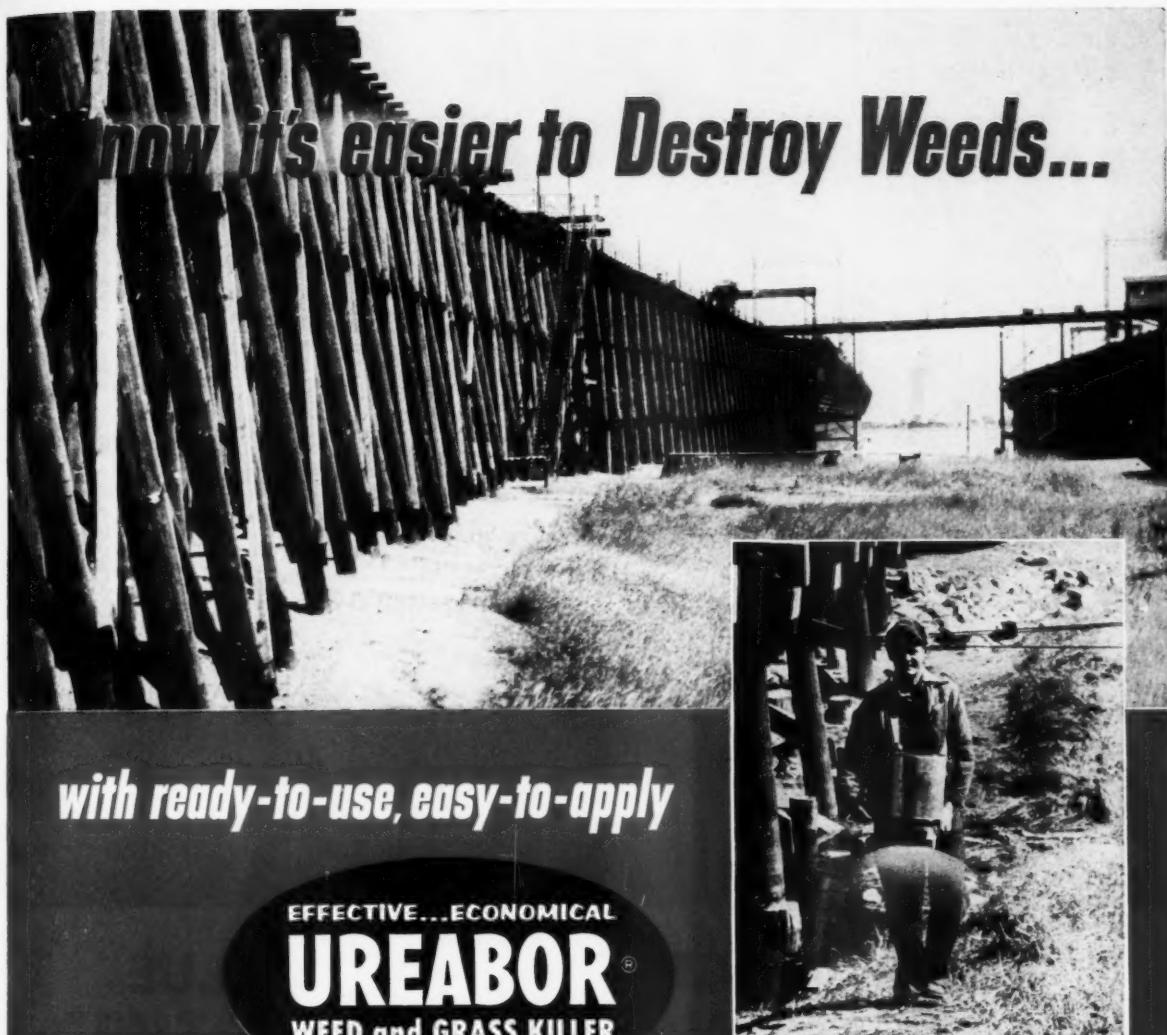
J. W. Higgins
Santa Fe



A. E. Lewis
SAL



S. G. Phillips
B&M



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EFFECTIVE...ECONOMICAL
UREABOR®
WEED and GRASS KILLER



Here's your thrifter, easier way to stop weeds! Look in that hand and you'll see enough UREABOR to kill vegetation in a 12 sq. ft. area! Consider the convenience and economy this can mean to you.

Consider, too, that a UREABOR "kill" remains effective for a season or longer. And UREABOR has important safety features; it is *nonflammable, nonpoisonous* when used as directed, and *does not corrode ferrous metals*. Protect your timber structures, yards and buildings from fire-hazardous weeds by applying UREABOR weed killer now...it's easier to apply!

**Nothing to mix...no water to haul
One easy application—dry—may keep ground weed-free for a season or longer!**

This special spreader for UREABOR makes application fast and easy...

The PCB Spreader applies UREABOR to best advantage, at prescribed low rates. It holds enough UREABOR to treat up to 2500 sq. ft. without refilling—weighs a mere 6 lbs.



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all-hydraulic HYDROCRANE®, including the off and on-track M.O.W. specialist, the H-5 crane with Road-Rail attachment (shown above); $2\frac{1}{2}$ to 8-yd. electric shovels and draglines; and railway cranes up to 250-ton capacities.

For expert equipment recommendations and prompt handling of your parts and service needs call on Central Equipment.

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ERIE**

BUILDS BETTER EQUIPMENT



No. 977 helps scale 200 cuts between Parkersburg and Clarksburg, W. Va., for the B & O. Reports Don R. Sensabaugh, system tunnel supervisor: "Best

feature of the No. 977 is its ruggedness. Working in close quarters, ease of operation, as well as its versatility, make it an ideal tool for our operation."

The B & O scales rock cuts with a No. 977 because it's...

"Rugged" —Every component of Traxcavators is designed to withstand tough operating conditions. Main frame is built of heavy steel and welded to form a one-piece unit. It is mounted so that loads and stresses are absorbed by the track roller frame, made of box section construction.

"Efficient in close quarters" —Instant response of controls and excellent operating balance provide quick maneuverability in close quarters. Now even more efficiency and quicker cycle times are possible in restricted areas with the exclusive Caterpillar Side Dump Bucket, available on all three Traxcavator models.

"Easy to operate" —All Traxcavator controls are located for convenient operation. Bucket lift and tilt levers are positioned for easy one-hand operation. The No. 977 has an automatic bucket positioner which returns the bucket to the desired digging angle at the

start of each pass. And the operator works from a high seat to give him all-around visibility and leg room.

"Versatile" —You'll find a use for a Traxcavator in practically every roadway maintenance job. These versatile machines can be used for loading, material handling, rock work, digging, backfilling, pioneering, bulldozing.

There's a Traxcavator to fit your exact needs—the No. 933 with a 1½ cu. yd. bucket, the No. 955 rated at 1½ cu. yd. and the No. 977, 2¼ cu. yd. size. And with these machines, as with all Caterpillar-built units, there's no need to tie up capital in parts inventory. There are 300 dealer stores across the nation, each ready to supply you with parts and service when and where you need them.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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**THE NO. 1 RAILROAD
CONSTRUCTION EQUIPMENT**

. . . a résumé of current events throughout the railroad world

Battle lines are being formed for a showdown between the railroads and railroad unions on the wage and featherbedding issues. The latter was brought to a head on November 2 when the railroads served the operating unions with demands for sweeping revisions in work rules. Previously the unions had filed demands for a 25-per cent pay increase, plus fringe benefits, and the railroads had countered with proposals for pay cuts of 15 cents an hour. A late report was the BLE was planning a strike ballot on the wage issue.

The operating brotherhoods reacted strongly to the demand for changes in working rules. While Grand Chief Guy L. Brown of the BLE said the railroads' demands "could have been worse," President H. E. Gilbert of the BLF&E, which faces elimination of firemen from locomotives in freight and yard service, was not so kind. The proposals, he charged, are "proof that the railroad industry intends to maintain its record profit levels by shoving thousands of employees into unemployment lines."

Meanwhile, a different view was expressed in an address at Chicago by President Edwin E. Hokin of the Union Asbestos & Rubber Co. He said the end of railroad featherbedding would result in more employment. The railroad supply companies alone, declared Mr. Hokin, would have to double their labor force to supply the modernized equipment the railroads could buy if relieved of featherbedding.

Another proposed railroad merger is in the news, this one involving the Rock Island and the Milwaukee. Rock Island directors authorized the road's executive committee to determine if a study should be made. Directors of the Milwaukee named a committee to launch a "feasibility" study. The merger would create an 18,175-mile railroad, the nation's largest.

The proposed merger of the Erie and the Lackawanna has run into opposition from other railroads. This opposition is of two kinds, said Lackawanna President P. M. Shoemaker in a recent address. The Nickel Plate and the New York Central, he said, want the ICC to impose conditions that will amount to an "insurance policy" against these roads being hurt. The second kind came from the Wabash and Lehigh Valley, which, said Mr. Shoemaker, raised "a phony issue having no proper part in the proceedings." His recommendation: A statute relieving the ICC from giving any consideration in mergers "to the effect upon competitive railroads or competitive forms of transportation."

After three weeks of renewed steel-mill operations it was indicated, as this issue was going to press, that railroad carloadings would rebound sharply from the low levels that prevailed during the steel strike. Estimates are that the strike cost the railroads 2,500,000 carloads of freight and \$610 million in revenues, and caused them to furlough 63,000 employees.

Toward lower tie costs

Speakers at the annual convention of the Railway Tie Association should be commended for their many suggestions aimed at reducing the cost of ties (page 22).

The most obvious way to reduce tie costs is to institute economical practices for making them last longer. The means being used by the Western Pacific, as described in an address by Frank Woolford, its chief engineer, cover about every known method of overcoming or reducing mechanical damage to wood ties.

Some of the suggestions made by the other speakers were more revolutionary, but none the less worthy of consideration.

- E. R. Snodgrass of the Koppers Company proposed a standardized boring pattern for ties, and also a step in the direction of standardized preservatives.

- R. B. Smith, forest products buyer for the Rock Island, implied that the tie-buying practices of the railroads were producing "very expensive results" in the form of higher prices for ties.

- Waldo E. Tiller, a tie producer, stating that railroads must pay a premium when demanding nothing but oak ties, declared they would save by using other hardwoods.

Standardization is a recognized method of reducing costs. Are there any insurmountable reasons why it can't be applied to ties?

Railroad men are aware their tie-buying practices sometimes result in inflated prices. Is there any insurmountable reason why they can't be changed?

It's been shown that hardwoods other than oak are adaptable for use as ties. Is there any insurmountable reason why they can't be used?

Needed—A new approach to the manpower problem

Evidence is piling up that a thorny problem for M/W departments is taking shape around the country. Letters and comments from maintenance-of-way officers indicate concern over a growing shortage of properly trained manpower in the M/W field.

Many years ago the railroads in general foresaw a possible shortage of technically trained men for supervisory positions. Steps were taken to cope with this problem by individual railroads and by the AREA through the Committee on Cooperative Relations with Universities. The result was that the majority of the larger roads now have some sort of plan or program for taking technical graduates into the organization as trainees for supervisory positions in the M/W or other departments. These programs, plus the promotional efforts of the AREA committee, seem to have been fairly successful in stimulating a reasonably adequate flow of engineering graduates into the railroad field.

The main trouble now lies elsewhere. While the railroads were concentrating on assuring themselves a supply of talent for the higher positions, their manpower situation was undergoing deterioration in another quarter. In reality two potential problems were building up, one having to do with foremen and the other with work equipment operators.

The foremen problem has apparently been in the making for some time. On many roads the situation that was developing in this area was obscured by the lengthening or elimination of sections. The effect of such action was to create a reservoir of trained manpower available for promotion to the position of foreman as vacancies occurred. Indications are that some roads have now come to, or at least can see, the bottom of this reservoir. They can also see something else, and that is a growing dearth of men qualified for promotion to the position of foreman.

The underlying reason for this problem is the seniority rule. Many capable young men with high-school educations would like to enter railroad M/W work with the objective of working up to a track or B&B foremanship. But they are deterred by the prospect of a long wait while they are accumulating the required amount of service.

M/W officers have struggled with this situation for many years, but indications are it is more acute now, at least on some roads, than ever before. Sooner or later it will have to be faced squarely, the seniority problem will have to be resolved and steps taken, such as the inauguration of training programs, to induce capable young men to enter M/W work.

The situation with respect to machine operators is somewhat similar. The need for capable, properly trained work equipment operators is widely discussed, but little has been done on most roads to place their selection and training on a systematic basis. Until this is done the railroads can't expect to get the most out of their heavy investments in work equipment.

The fact is the revolution that has occurred in the technology of M/W work needs to be matched by a comparable revolution in methods of selecting and training the men needed to implement the new technology.

Trim right-of-way
MAINTENANCE COSTS
 with this
NEW HIGH SPEED
BRUSH CUTTER!



"Slash" is the word to describe what the new Southworth portable Brush Cutter does to right-of-way maintenance costs. One operator, plus this lightweight, versatile performer, does the work of eight men with brush hooks or scythes. The two big features that make this equipment so valuable are extreme maneuverability and "work horse" power. Exclusive saw arm elbow and knee joints provide easy cutting of brush, trees or limbs at any height within reach. Extra power permits cutting of trees up to 8" and larger, by notching.

The major portion of the Brush Cutter's 39 lbs. is carried comfortably on the operator's back...nature's saddle...where the weight is hardly noticeable. "V" belt drive simplifies field maintenance, eliminates costly repairs, gear stripping, etc. Added features include automatic clutch, finger tip throttle control and large gas capacity for long hours of uninterrupted use. The cutting arm is easily disassembled in less than one minute for convenient transportation. Special 10" heavy duty circular saw is positioned for operator safety.

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● **MECO RAIL AND FLANGE LUBRICATORS**
 double to quadruple life of curved rails and locomotive wheel flanges. Available for single and double rail installations, main lines, yards, industrial tracks, running rails and guard rails.

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Prolongs the life of switch points about 4 times; then is reversed and again extends the switch point life for another similar period.

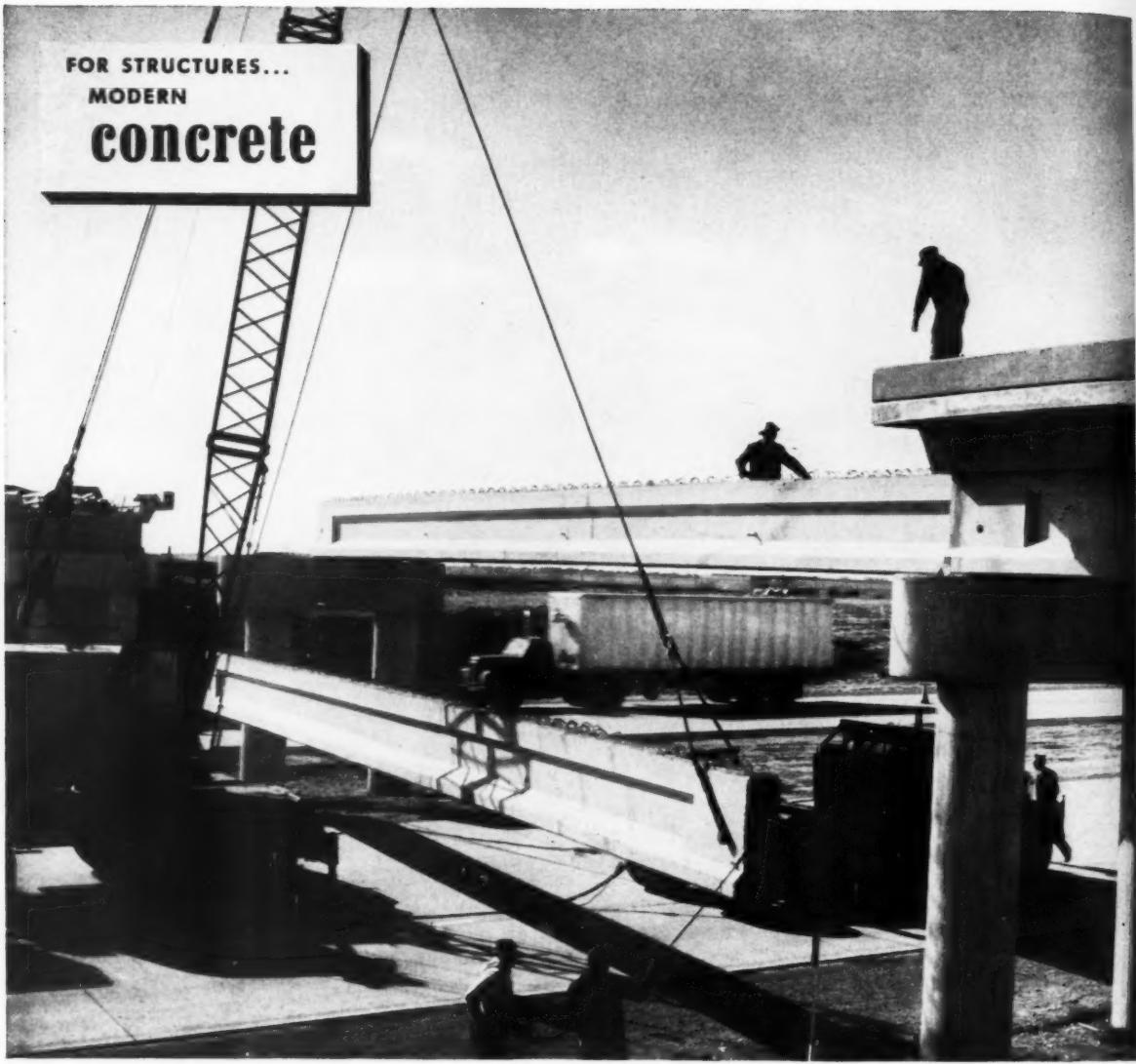
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Reduces labor cost to minimum in laying Standard Rails, Long Rails, Continuous Welded Rail. Operates efficiently with large gang of 100 men or more and requires a machine crew of only 3 or 4 men.

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Four-span railroad bridge over Dallas-Fort Worth Turnpike...

Great Southwest RR saved \$10,000 by choosing bridge girders of prestressed concrete

The twelve pretensioned, prestressed concrete bridge girders over the Dallas-Fort Worth Turnpike are the longest of this type ever used on a U.S. railroad. Great Southwest achieved low cost and ease of erection, got the bridge up fast across the busy turnpike. The twelve 67-foot beams and twelve 46-foot beams were all placed in two daylight working days without interrupting traffic!

The cost of all girders in place was only \$26,370. Part of the savings came from the inherent economy

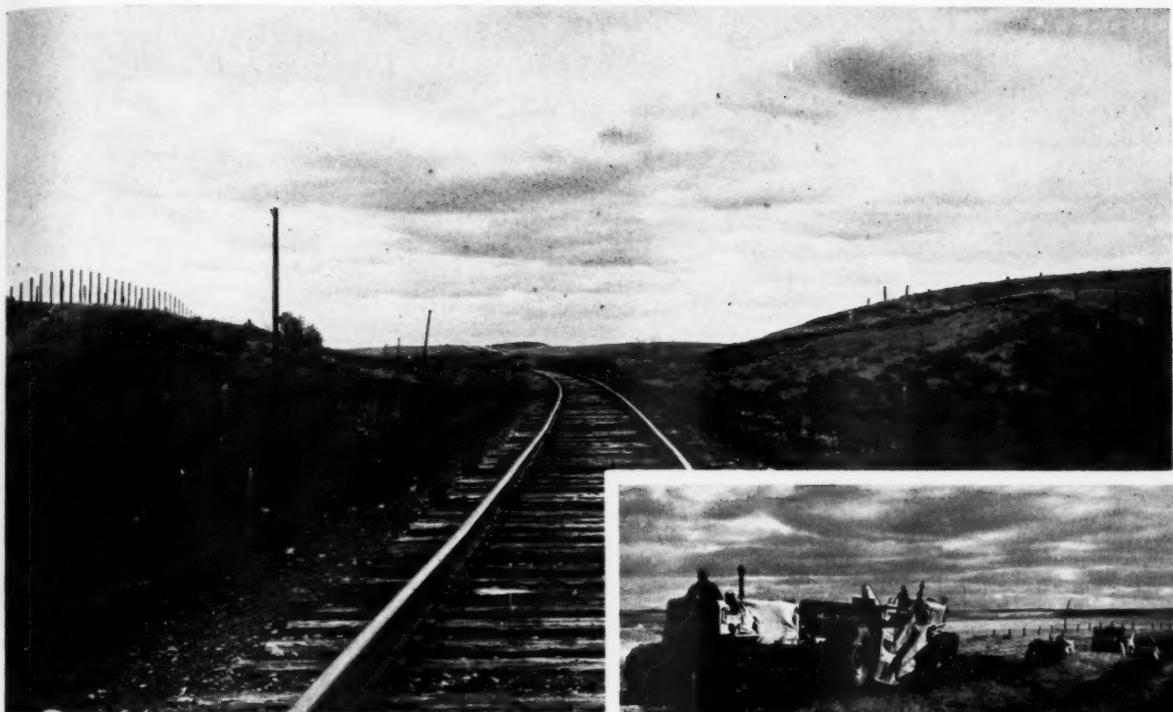
of prestressed concrete construction. Even greater savings were possible because engineers modified highway girder forms on hand for railroad loading, saved the cost of special forms.

Great Southwest is one more modern railroad turning to concrete for construction economy, durability and more efficient operation.

*Design by: Powell and Powell, Consulting Engineers,
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Owners: Great Southwest Railroad, Inc., Dallas, Texas*

PORLTAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete



STREAMLINED CUT (above) on Soo Line's Whitetail line. Cut was widened in 1958. Photograph at right of grading outfit in operation was taken in October 1959 near end of working season.



Soo Line fights snow with

Long-range cut-widening program

For more than a decade this road has kept a grading outfit busy cutting back the slopes of cuts in territories that have a history of trouble from snow accumulation. To date a total of about 6,000,000 cu yd of earth has been moved. Result: Lower overall costs from snow storms, better drainage, visibility.

slopes of cuts in Minnesota, North Dakota and Montana. And plans are for the program to be continued until all cuts in snow territory have been streamlined.

The quantities moved from individual cuts are not large but in the 11 years the program has been underway they have totaled up to a whopping 6,000,000 cu. yd. The cost has been about \$1,250,000.

Benefits of the program

This money, company officials feel, has been well spent. The plowing of snow-clogged cuts, while it hasn't been eliminated, has been greatly reduced in territories where the cuts have been reshaped. For example: Cuts on the line between Drake, N. D., and Fordville, 132 miles, have

● Snow storms in the territory served by the Soo Line are no less severe than they were years ago. And since some of this road's line get up pretty close to the Canadian border it's a safe bet that the snow conditions encountered are about as bad as anywhere in the country. Yet each year winter storms lose some of their

power to hamper Soo Line operations.

It's all because of a long-range program the road has had underway for 11 years to flatten side slopes in cuts so that the wind will have a clear sweep across them. Beginning in 1949 a grading outfit has been whittling away at the task of cutting back the

Long-range cut-widening program cont'd

CUT-WIDENING work done to date and that planned for the near future are shown on the map below. Since lines east of Minneapolis are not involved in the program they are not shown. The grading outfit worked this year on the branch that extends to Whitetail, Mont.

GRADING under way (right) in cut on Whitetail line near Raymond, Mont. Slope at left has been completed except for final dressing being done by the grader in background. Work has just begun on right slope. White lines show standard section for snow cuts.



been streamlined. Formerly, this line couldn't be plowed within the 16-hr law. Now the line can be plowed in less than 16 hr.

The result is that train service on the lines where cuts have been widened is more dependable and overtime of train crews has been reduced. Also it has been possible to eliminate many miles of snow fences and the cost of maintaining them.

And there are additional benefits that have nothing to do with the snow problem. Better drainage, with greater roadbed stability, is one of them. Improved visibility at highway crossings and for motor car operators is another. Soo Line officers feel these benefits are such as to justify much of the time and money spent on the work.

The map gives an idea of the amount of cut-widening work done to date and the sections slated to be streamlined during the next few years. In selecting the sites to be streamlined the road's engineering department keeps four or five years ahead of current progress. The program is confined to the lines west of Minneapolis. Lines east of that city, where some cut-widening work was accomplished years ago, are felt to be in pretty good shape, with little or no ad-

ditional work considered necessary.

Because of level terrain, the road's main line between Minneapolis and Portal, N.D., has caused little trouble. It's the secondary lines that have presented the major problem, primarily because they pass through numerous hillocks in a predominately east-west direction, with the result that the cuts often become plugged with snow. Originally, the practice was to widen only those cuts in a given area that had a bad history of snow accumulation. Now most cuts that rise above the top of rail are included in the program.

Slopes are 5 to 1

A standard cut after being widened has backslopes of 5 to 1, although slopes flatter than the standard are graded if a grade crossing is adjacent to or intersects the cut, the purpose being to promote visibility. Formerly the standard section for streamlined cuts provided for a flat-bottom ditch 8 ft wide and 2 ft deep, which started 10.5 ft from the centerline of track. This year the road is trying out a new ditch section (see drawing) which provides for a V-ditch starting 9 ft from the centerline. The ditch has a depth of 2.5 ft below the top of tie,



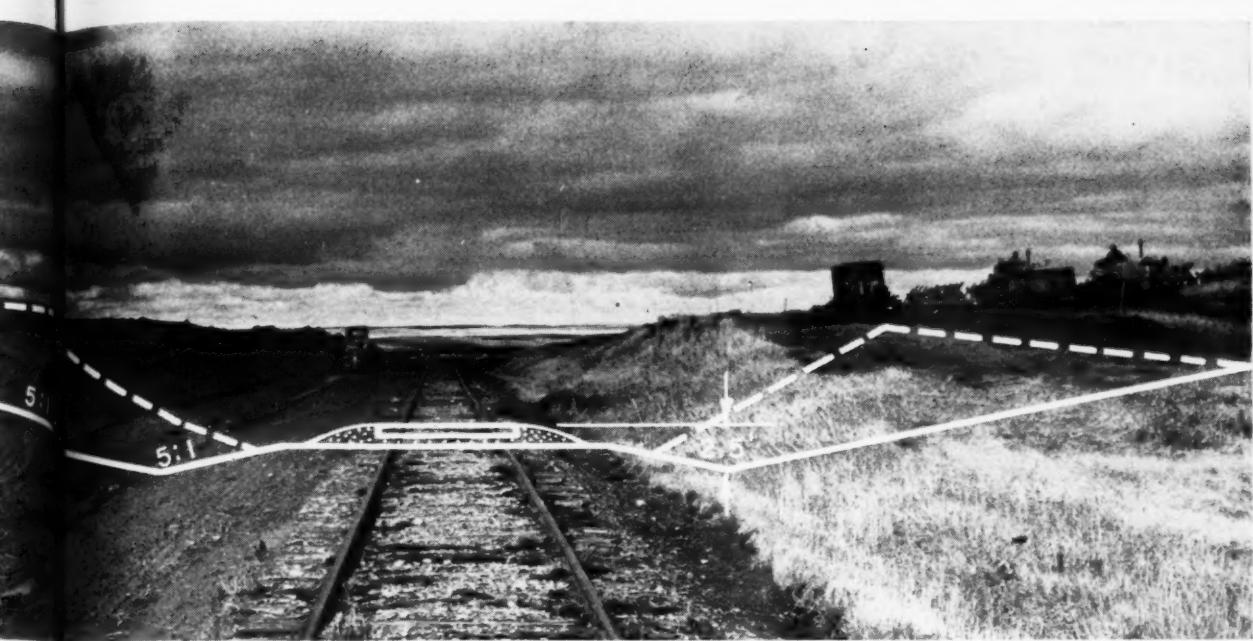
Flatter slopes

and both slopes are 5 to 1. Object of the new section is to improve drainage and reduce frost heaving.

Variations from the standard have sometimes been required where the cut is too deep or there is insufficient right of way or for other reasons. In many instances additional right of way has been acquired to permit a standard slope. Some of the additional land required has been purchased, but more recent practice is for the Soo Line's real estate department to arrange an easement, paying for the land if necessary but claiming no title to it.

Similar arrangements are made where additional land is needed for wasting. The availability of material for wasting has afforded the road an opportunity to promote good relations with local land owners by construction of cattle ponds, nominal grading for roads and filling in low spots and swampy areas.

All of the cut-widening work is being done by a single grading outfit. Four Caterpillar D7-No. 70 tractor-scaper combinations, push-loaded by a fifth D7, do the excavating and hauling work. Still another D7 with bulldozer blade was added this year. Making short runs of 50 to 150 yards, the loaded scrapers generally dump



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the waste yardage in low areas along the right of way. After the tractor-scaper units have completed their work a Caterpillar No. 12 motor grader moves in for final grading, ditching and bank sloping.

The equipment is worked two shifts daily. Kohler light plants provide illumination for night work. Stakes for the grading work are set by an engineering party that works about three miles ahead of the outfit.

Whenever possible the grading outfit starts work in the spring close to Minneapolis, but moves to North Dakota or Montana as soon as the ground dries out sufficiently in those areas to permit grading work to proceed.

This year the outfit has spent much of the time working on a 17-mile stretch of line in Montana. It was estimated that it would move approximately 800,000 cu yd of silt and clay before winter closed in. In some years the crew has been able to continue working almost up to Thanksgiving, but this year it ceased operations in October. At the end of each working season the equipment is taken to Glenwood, Minn., where it is thoroughly overhauled.

All of the cut-widening work so far has been in earth or loose gravelly



PUSHER TRACTOR helps tractor-scaper unit pick up load in cut through gravelly soil.

earth. No rock of any consequence has been encountered. In a few places, 1.5-to-1 "shovel cuts" have been graded because the cuts are so deep that wind won't sweep them clear. Extra-wide ditches are provided in such cuts to allow more snow to be accumulated.

Newly graded slopes are seeded with a grass seed mixture at the rate

of 50 or 60 lb per acre. This practice is related to the one item of increased maintenance resulting from the cut-widening program. This is the need for mowing the slopes with relative frequency to assure the effectiveness of the cut widening work. However, it should be noted that the flatter slopes facilitate the mowing operation.

Can crosstie costs be reduced?

• Railroads can cut the cost of the crossties they use, but they can't do it without making important revisions in some of the practices they have been following for many years.

This statement summarizes opinions expressed in addresses presented at the recent annual convention of the Railway Tie Association. The meeting was held at the Netherland Hilton Hotel, Cincinnati, Ohio, October 28-30.

The appeals for changes in crosstie practices came primarily from producers and treaters of wood ties, but not entirely. A railroad man told the group how the railroads' crosstie buying practices produced "very expensive results" in 1956 and again in 1959.

Standardization of crossties was one of the areas in which savings were visualized. But there are obstacles confronting such a step, according to F. J. Fudge, timber engineer of the New York Central, and chairman of the Committee on Ties of the AREA. ". . . Some railroads do not require their ties to be adzed and bored while others do," he explained. Moreover, he said, "those railroads requiring adzing and boring have many different sizes of tie plates and these plates have many different locations of holes for spikes. The railroads would first have to standardize the spacing of spike holes and size of tie plates." His conclusion: "Standardization of adzing and boring is a long way off."

Suggests standardized boring

A suggestion for overcoming this problem, including a definite proposal for a standardized boring pattern, was offered by E. R. Snodgrass, manager operating and engineering department,

Yes! This answer was given by several speakers who addressed the recent convention of the Railway Tie Association. But some of the proposals run counter to present practice. One speaker, for example, suggested a standard specification for treated ties. Another recommended the wider use of hardwoods other than oak. A third implied that some changes might be in order in the railroads' tie-buying practices.

Wood Preserving Division, Koppers Company, Inc. His proposal was made on the premise that "probably the principal benefit from adzing and boring crossties before treatment comes from the assured penetration of preservative in the wood around the spike."

Since selection of one spike-driving pattern as a standard is not practical, said Mr. Snodgrass, "we can do as some railroads have already done. We can compromise and bore a pattern, not for spikes but for assurance of preservative penetration in the rail base area of the tie." His recommendation is that eight $\frac{1}{2}$ -in holes be drilled, four at each rail base, in a staggered pattern that will fall well under the rail. The theory is that "end grain penetration of the preservative from these holes will spread into the area where spikes are driven."

"Driving spikes away from the drilled holes has been practiced inadvertently for so many years that I expect we might even find service records to show that the practice is acceptable," declared Mr. Snodgrass. In addition to the proposal for a standard boring pattern he recommends a "light adz cut over an 18-in wide portion of the face of each tie at the rail base."

A long step toward a standard preservative specification for crossties was also proposed by Mr. Snodgrass. As the situation stands now, he explained, there are in common use some 10 preservative solutions or mixtures and each is used in some four or five retentions, resulting in "forty or fifty preservative specifications in common use." Reasoning that "a compromise on one preservative may be too great a step to take all at once," Mr. Snodgrass offered two preservative specifications for consideration as a possible standard. These are: A 70/30 creosote-coal tar solution to be used in not less than 7 lb per cu ft retention; and a 50/50 creosote-petroleum mixture to be used in not less than 8 lb per cu ft retention.

On the matter of the advantages to be derived from a standard treated tie, Mr. Snodgrass pointed first to considerable savings in investment dollars and operating expense that, he said, would be realized at the treating plant. But these savings, he added, are "incidental to the big benefit of having a standard treated tie." A tie "acceptable for use at any point on any railroad, even if it were acceptable only as a second choice, would encourage tie producers to maintain inventories from which the railroads could meet their widely fluctuating crosstie needs. It would give the tie maker a steady market for his crossties. The cost to the tie makers, the tie treaters, and the railroads will surely be less than the costs under our present day efforts to schedule tie making and tie treating in step with 'feast or famine' track maintenance."

The mechanism that causes tie buying on a "feast or famine" basis to be



D. B. Frampton, Jr.

These new officers were elected

President—D. B. Frampton, Jr., vice president, B. B. Frampton & Co.; first vice president—M. L. Wilson, manager, Tie Dept., Kirby Lumber Corp.; second vice president—Henry Webster, president, Webster Lumber Co.

E. J. Littleton, manager railroad sales, Jennison-Wright Corp., was elected a new member of the Executive Committee.

Other members Executive Committee—R. G. Juengel, Gross & Janes Co.; C. F. Seyer, Jr., dist. manager, Wood Preserving Div., Koppers Co.; A. B. Taylor, Jr., pres., Taylor-Colquitt Co.

W. L. Winham, T. J. Moss Tie Co. and immediate past president, also becomes a member of the Executive Committee.

• "The cost (of a standard treated tie) to the tie makers, the tie treaters, and the railroads will surely be less than the costs under our present-day efforts to schedule tie making and tie treating in step with 'feast and famine' track maintenance."—E. R. Snodgrass

• Railroad tie-buying practices created in 1956 and 1959 "a concentrated, false, 'pent-up' demand resulting in some of the roads' buyers competing against each other to the detriment of all with respect to supply as well as price and with very expensive results."—R. B. Smith

• "There isn't any doubt but what the roads demanding nothing but oak ties will have to pay a premium in price, and frankly, I doubt in an active market they can procure all their requirements in nothing but oak."—Waldo E. Tiller

• ". . . A 40-, or possibly a 50-, year life should not be unreasonable to expect from an average wood tie properly seasoned, effectively treated and protected before being placed in track."—Frank R. Woolford

costly to the railroads was explained in an actual example cited by another speaker, R. B. Smith, buyer forest products and manager treating plants of the Rock Island. As he described it, this is the way the example worked out:

"In early 1958 when business was in a severe slump there existed a distinct buyer's market in railroad crossties and they were less costly than at any time since 1955, despite the labor and stumpage cost increases during that period. It was an ideal time to continue a high level of tie buying, with substantial savings to be realized over the carrying charges.

"Unfortunately, for financial reasons, we like all other railroads discontinued our tie purchases from March to September 1958 and have since had considerable difficulty in getting our producers to meet their quotas. In fact we found it necessary, effective August 1, 1959, to increase tie prices approximately 10 per cent to stimulate production and to meet the prices being paid by other railroads in the same tie producing territory.

"In other words, while remaining out of the buyers' market in 1955 and 1958 while other railroads were doing the same, our tie inventories were decreasing to the point where, in mid-1956 and again in mid-1959, most midwestern railroads, including the Rock Island, found it urgently necessary to increase their purchasing. This created a concentrated, false, 'pent-up' demand resulting in some of the roads' buyers competing against each other to the detriment of all with respect to supply as well as price and with very expensive results."

Another crosstie buying practice of some roads—that of demanding nothing but oak ties—came under critical scrutiny at the meeting. Waldo E. Tiller, president of the Tiller Tie & Lumber Co., offered a word of warning on this score. "There isn't any doubt," he said, "but what the roads demanding nothing but oak ties will have to pay a premium in price, and frankly, I doubt in an active market they can procure all their requirements in nothing but oak."

"There is a heavy drain throughout the country on oak timber," said Mr. Tiller. "The stands are rapidly being diminished and the competition between various wood products for what oak stumpage is available is fast increasing the price, and is, at the same time, diminishing the supply."

Mr. Tiller is also convinced that the "present specifications should be changed to permit more tolerance on wane." He described as "inconsistent" the practice of allowing "certain amounts of wane on some items such as car material and plank" and not allowing a comparable amount on crossties.

In Mr. Tiller's opinion, "the most important thing for you railroad engineers and purchasing agents to realize at this time is that your crossties are being made by and large by saw mills that have the same opportunity to cut the same timber into wood products other than ties. If you do not meet the situation with comparative specifications and prices of other wood products, you are going to find that the sawmills will more and more stop cutting crossties and cut other items such as decking, plank, car material and flooring stock."

Extensive experiments with pentachlorophenol-petroleum solution as a preservative for crossties were described by E. A. Bromley, the CNR's vice president, purchases and stores. These were started in 1954 with 5% penta in petroleum. Later the amount of penta was reduced to 3%. According to Mr. Bromley, tests have "confirmed" that 3% solutions of pentachlorophenol in the oils used "have at least equivalent fungicidal properties to 50/50 creosote-petroleum solutions. . . ."

The policy the CNR is following in the treatment of ties with penta "is purely an economical one and has been made possible because of the availability of suitable petroleum oil within close proximity of Edmonton at attractive prices. The intent has been to find a lower cost preservative equal to standard 50/50 creosote-petroleum mixture and thus introduce competition in the treating industry." To date, explained Mr. Bromley, the CNR has treated 1,970,000 ties with penta at its plant at Edmonton, Alta.

Making ties last longer

Frank R. Woolford, chief engineer of the Western Pacific, told of a three-pronged program—larger tie plates, tie pads and dowelling—in effect on his road to get more service from ties. As for larger tie plates, he stated that by replacing 8-in by 11-in plates with 8 by 14 plates, especially in curved-track territory, "tie life will be extended a minimum of some 6 years, or from a very short life of 9 years to 15 years and longer."

Mr. Woolford is "positive" the use of protective pads extends tie life, "thereby producing attractive savings." "Used with 8 by 11 tie plates in a curved-track area," he said, "tie pads will increase tie life from 9 to approximately 18 years; with 8 by 13 plates from 15 to approximately 25 years; and with 8 by 14 plates from 18 to 27 years or longer."

As another measure to prolong tie life, the Western Pacific adopted this year a program of dowelling all main-track ties giving evidence of splitting and all switch and bridge ties. In Mr. Woolford's opinion "a 40-, or possibly a 50-, year life should not be unreasonable to expect from an average wood tie properly seasoned, effectively treated and protected before being placed in track."



BRUSH CUTTER weighs 39 lb and is carried on operator's back leaving arms free to maneuver jointed cutting arm to any desired position.

Production goes up with portable

Brush-cutting operations on the Illinois Central have been mechanized through the use of a power-driven, high-speed saw. The road's experience is that two men using two of the machines can cut approximately an acre a day, depending on density of the brush and the nature of the terrain.

High-speed, lightweight, back-carried brush cutters are proving helpful to the Illinois Central in coping with the problem of brush growing on the right of way.

The brush cutters used on this road are all of the Southworth Senior model, which weighs 39 lb and has a heavy-duty 10-in saw at the end of a jointed arm. There are now 19 brush cutters of this type in use on the IC, which are distributed among the road's 13 engineering divisions. They are used by the section forces under the supervision of the track supervisors.

Through arrangements made with P. A. Cosgrove, division engineer at

Champaign, Ill., a brush-cutting operation involving use of the back-carried saws was recently inspected near Bloomington, Ind. G. G. Phillips, supervisor of track at Bloomington, was present to explain the operation. Three men were engaged in the work, two operating brush cutters and one spraying the stumps with dormant basal spray to prevent growth of shoots.

The work location was a fill about 30 ft high with steep rocky side slopes. The brush being cut consisted primarily of a 4- or 5-year-old growth of locust intertwined with grape vines, but also included a stand of elm trees located under the wire line. Grass at the

foot of the slopes had been previously cut with a mowing machine. The men operating the brush cutters were wearing plastic face shields. Also, due to the thick growth and the sharp barbs of the locust trees their legs were protected with shin guards of the type used by baseball catchers.

It was noted that, since the saws are carried on the backs of the operators and suspended by shoulder straps, the

How to cut a tree . . .



1 Trees up to 10 in. in diameter can be cut by notching.



STUMPS are sprayed with a dormant basal spray to prevent growth of shoots. Spraying is done within 12 hr of cutting.



INSIDE of curves, around road crossings and under wires are cut first.

Double brush cutters

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arms of the men are left free to maneuver the cutting arm. It was also noted that the jointed construction of the arm, as well as a rotating feature incorporated in the lower section, gave the necessary flexibility in placing the cutting blade at various levels and angles.

Since much of the growth being cut ranged from 2 in to 4 in. in diameter, it was possible to sever most of the

stems with a single pass of the blade. However some of the elm trees ranged up to about 10 in. in diameter. To cut these they were first notched on one side and then cut through to the notch from the opposite side (see photographs below).

The cutting conditions encountered on the day the work was inspected were unusually rugged, according to the men doing the work. "The rocky

bank and the barbs of the locust trees made the cutting we did today about as tough as any I have experienced," said one of the operators. Even so, it was estimated by Mr. Phillips that about 20,000 sq ft of brush was cut in 3½ hr of actual working time.

Spraying the stumps

The man spraying the newly cut stumps carried a tank of the chemical on his back by means of shoulder straps and was using a nozzle two feet long to make the application. According to D. H. Yazell, assistant engineer, who is the road's specialist on weed and brush control, the chemical application should be made the same day the brush is cut for maximum effectiveness, or at least within 12 hr.

The correct method of application, said Mr. Yazell, is to spray on the chemical until it runs down the bark. It is the amount of chemical that penetrates the bark that is effective, rather than the chemical action on the cut surfaces of the wood, he said. It is



2 Notch is cut by angling saw blade to make an upward diagonal cut.

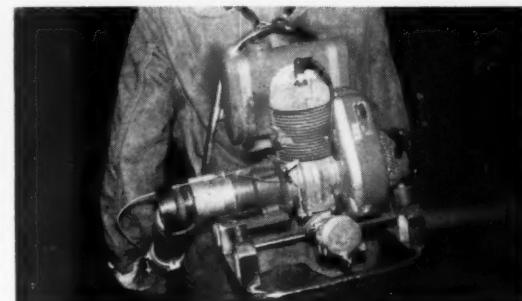


3 Final cut is made through to the notch from opposite side of tree.



Cutter used has aluminum engine

The Senior model of the Southworth Brush Cutter consists of a two-section, jointed cutting arm (above) and a 2.8-hp, 400-rpm West Bend aluminum engine (below) fastened to an aluminum saddle. The 10-in blade is powered from the engine by means of pulleys and V-belts. The saw is manufactured by the Southworth Machine Company, Portland, Me., and distributed to railroads by the Maintenance Equipment Company, Chicago.



Brush cutters cont'd

also important, he added, to be sure that all exposed roots are covered by the chemical. "If the chemical is correctly applied," explained Mr. Yazell, "the stump will generally rot and disintegrate within a year of the application, or within two years for more resistant species.

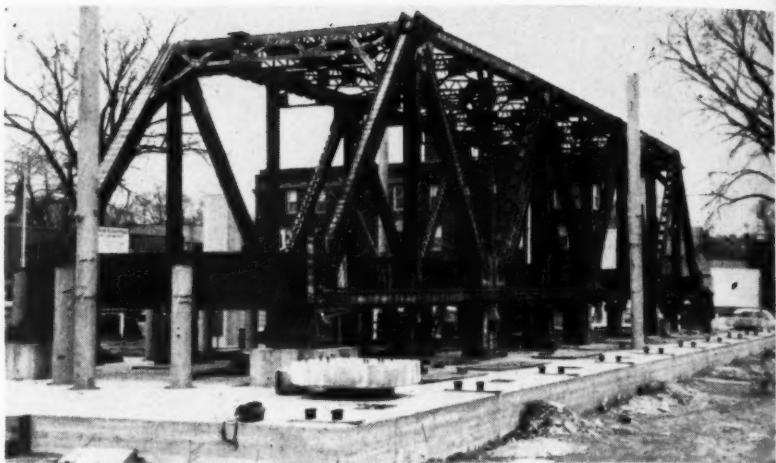
When using one cutter

Brush-cutting operations are sometimes carried on with only one brush cutter instead of two, according to Mr. Phillips. In that case the cutting crew consists of two men who spell each other in operating the saw. In this type of operation the man not cutting uses a forked pole to keep the brush out of the way of the cutter operator.

One advantage of having two machines on the job is that the cutting can continue if one of them is temporarily out of service. However, because progress is slower when each man has to clear his own path, Mr. Phillips estimates that the amount of brush cut with two men with two cutters is only 1½ times as much as two men with one cutter, depending on the height and thickness of the brush being cut.

The actual procedure used on the IC when cutting brush is relatively simple—the operator always keeps the open area, or the previous swath, on his left. When working on a slope the operator starts at the bottom and works up, always laying the cuttings downhill to his left in the previous swath. However, in areas where the brush being cut is 6 ft or less in height the operator can simply wade in and start cutting, letting the brush fall where it will.

In addition to the brush cutters the Illinois Central also uses chain saws and mowing machines in its brush-cutting operations. The brush cutters are generally used where the brush has attained more than a year's growth but does not exceed 8 in or so, although, as noted, these units can be used to cut trees up to 10 in. in diameter. However, if a considerable number of trees larger than 8 in exist in the area being cut, a chain saw is generally used. In areas where the ground is level or on a slight slope, and the brush is less than a year old, it is considered more economical to use a mowing machine.



RESEARCH SPAN (before it was enclosed within a building) is a half-scale replica of a warren truss double-track bridge having a 200-ft span, designed for Cooper's E-60 loading. Truss A (right) has outstanding angles and Truss B has angles turned in.

Test end posts to failure in model span

Description of test bridge

The test bridge is a half-scale replica of a standard Warren truss double-track bridge having a 200-ft span, designed for Cooper's E-60 loading. The sections making up the members of the research span are ¼ of the size required for a 200-ft span. The four corners of the 100-ft research span are supported on reinforced-concrete caissons 3 ft 6 in. in diameter which extend down about 100 ft to rock. For test purposes, the bridge is held immobile longitudinally at the middle of the span by tie rods extending both ways and anchored into the end caissons. All four bearings are of the roller-nest expansion type.

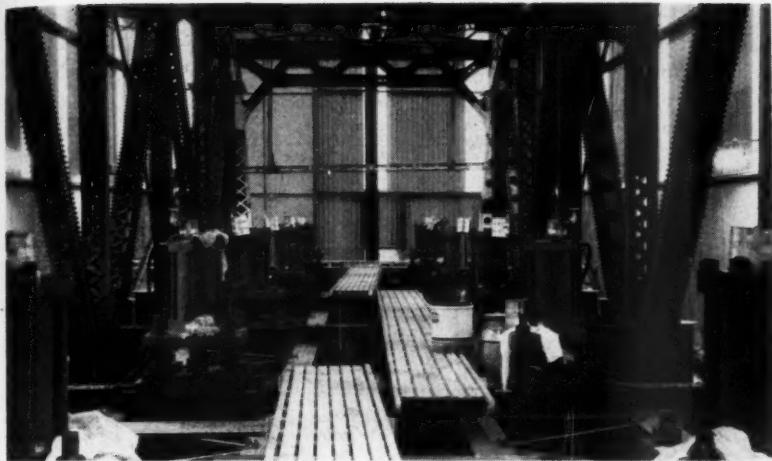
It is the intent to test individual members of the bridge. These will be made up of ordinary structural-steel and of high-strength steel. The former represents the great bulk of tonnage in existing older bridges, and the latter is the trend in recent large bridge construction. The first phase of the investigation is concerned with the study of ordinary structural-steel members. The second phase will be a determination of the carrying capacity of damaged end posts.

The bridge is built of high-strength

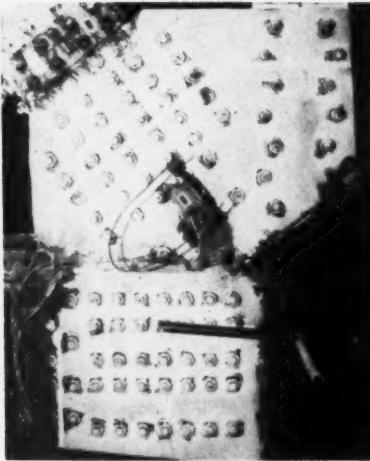
steel of medium manganese, similar to ASTM A-242, having a minimum yield strength of 50,000 psi. The ordinary structural-steel members to be tested are of carbon steel, ASTM A-7, having a minimum yield strength of 33,000 psi. Hence, when certain of these members are tested to failure, the remainder of the structure will be undamaged.

The two trusses of the research model are different. Truss A is comprised of the type of members found in existing older railroad bridges. Top chords and end posts have angles turned out, with a solid cover plate on top and lacing on the bottom. The other members are the same except that the lacing on the bottom consists of ties and diagonal bars. Truss B is comprised of the more modern type of truss members having angles turned in and with a solid cover plate on top, web plates, and ovaloid perforated-hole plates on the bottom instead of lacing. All field connections were made with high-strength bolts to permit changing of test members.

As designed, the span also is capable of carrying heavy highway loads. It is also designed for both working and ultimate loads.



HYDRAULIC JACKS, of 150-ton capacity, were placed at the quarter points on each side of the seven floorbeams, making a total of 14 jacks. Two hydraulic systems made it possible to simulate Cooper's loadings and for each track to have different loads.



BOLTED CONNECTIONS at top and bottom of end posts had extra bolts for developing their full strength.

The first test of a series was made at Northwestern University for determining whether there is greater compression strength in end posts of bridges than has been found through laboratory testing machines. Results show that they sustained three times their design load before failure.

Bridge engineers can take heart from a test made early in November at Northwestern University, Evanston, Ill. A test to failure was made on two end posts of a half-scale model of a double-track Warren truss bridge. These members held three times their design load before permanent deformation took place.

Dealing as they are with dynamic forces which are difficult to predict exactly, bridge engineers play safe by using a factor of safety of about two. This means they design structures to carry loads twice as heavy as are expected to be imposed. In the knowledge that the end posts in the test span took three times the design load before failure, bridge engineers can now give permission to allow unusually heavy loads over a structure with more assurance.

This test was the first of a series proposed on various members of the bridge. Among several objectives, one purpose is to determine the maximum load-carrying capacity of compression members in a bridge as governed by the end posts. Another is to determine whether an end post having outstanding angles is better than one with the angles turned in.

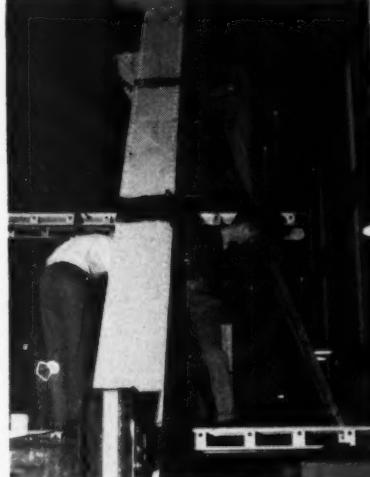
Hydraulic jacks, each with a capacity of 150 tons, were placed on each

of the seven floorbeams, one near each end at the quarter points, making a total of 14 jacks. Two separate hydraulic systems permitted simulating Cooper's loadings with the jack loads at the L1 and L3 panel points $1\frac{1}{8}$ times the loading on other panels.

The first loading was the design load of 40 kips on all jacks except those at the L1 and L3 points, where 55 kips were applied. Loadings were increased to $1\frac{1}{2}$ times the design load, then in 10-kip increments until the 120-kip loading (with 165 kips on the L1 and L3 points) was reached. After holding this loading for 10 minutes, the end posts of the trusses permanently deformed.

There was no buckling of any component parts of the end posts, but there was an integral yielding throughout. The first sign of failure was the appearance of yield lines at the edge of a perforated hole in the underplate of Truss B at the 110-kip loading. Then yield lines at rivet-hole spacing and Lueder lines appeared on the coverplate of Truss B. A few yield lines appeared on the coverplate of Truss A.

Total deflection under the 120-kip loading was $3\frac{1}{4}$ in. When the load was released, the trusses recovered their camber to within $\frac{3}{8}$ in.



SWARMING over the structure after each loading, engineers checked strain gages, slip gages and check points.



FAILURE of top coverplates of end posts was revealed by yield compression lines. Truss B showed more than Truss A.



GIRDERS of the new bridge are 11 ft deep. The bridge spans a new 10-lane interstate highway and two frontage roads. It's at Dallas.

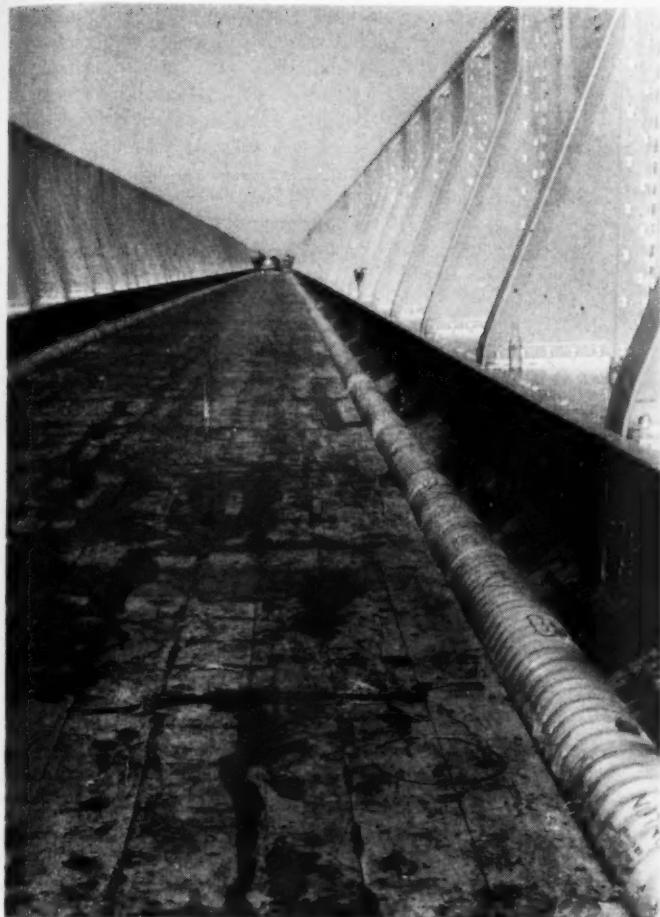
Long ballast-deck bridge has a



BALLAST was placed directly over asphalt planks and half-circle corrugated metal covers.

● A new through plate-girder bridge, one of the largest to be built in Texas, has its ballast-deck drained by a specially fabricated drainage system consisting of perforated corrugated metal pipe.

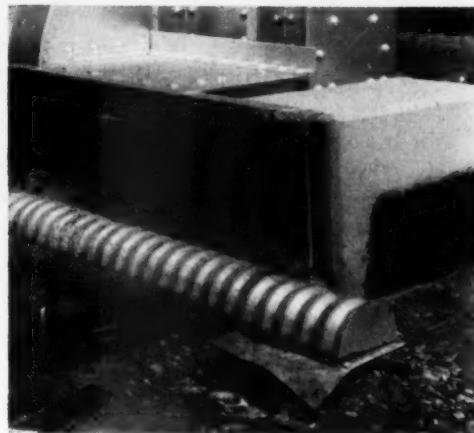
Spanning Interstate Highway 35E at Dallas, the bridge carries a single track of the Rock Island over ten lanes of the expressway and two frontage roads. It is 500 ft long and has a 312-ft continuous span. The drainage system was furnished by Armco Drainage & Metal Products, Inc. The bridge was designed by DeLeuw, Cather & Co., Chicago. The girders were fabricated in the Todd Shipyards, Houston, Tex. Contractor was the Texas Bitulithic Company, Dallas, with steel erection by John F. Beasley, also of Dallas.



ASPHALT planks were installed over waterproofing to protect it from ballast.

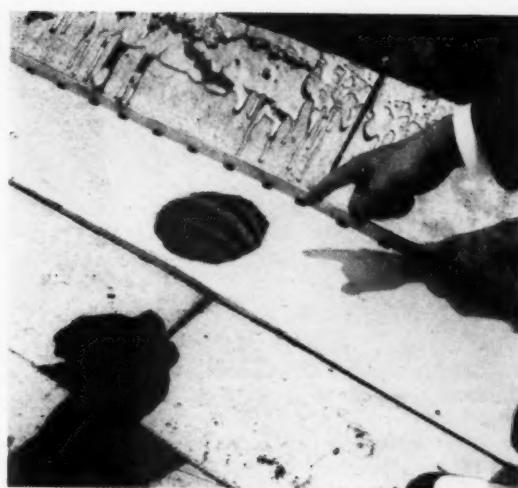
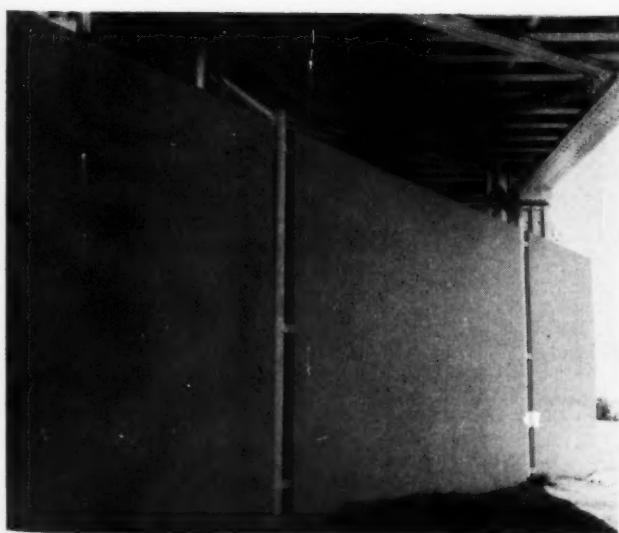


CONTINUOUS flanged pans were laid on both sides of bridge (above) to receive sections of pipe. Downspouts (below) are behind abutments and at piers.



Dallas.

has a tailor-made drainage system



OUTLET for downspout at pier (above). View at left shows how downspouts at piers are recessed into face of masonry.

Paved tracks at pier . . .



USE OF girder rail through concrete platform precluded need for building flangeways.

Laid with girder rails,



CROSSOVER with girder guard rails, tongue-and-mate switches before being paved.

tongue-and-mate switches

● Girder rail, girder guard rail and tongue-and-mate switches figured prominently in the trackwork installed at a new marine terminal at Duluth, Minn. Trackwork of these types was selected to realize savings in installation costs and other advantages where the track was located in paved areas.

The new facility, known as the Arthur McClure Marine Terminal, is served by the Soo Line and was constructed by Duluth's Seaway Port Authority in expectation of heavy traffic from the St. Lawrence Seaway. It includes a pier 3100 ft long and 1900 ft wide. Two buildings are located on the pier, a transit shed and a warehouse. It is also served by twin traveling gantry cranes.

The facilities on the pier are served by eight tracks, including two under the gantry cranes. A working area 460 ft long and 55 ft wide at the gantry cranes was paved with concrete. At other locations, including the track areas, the pier is surfaced with bituminous paving.

For the most part the tracks on the pier were laid with 115-lb T-rail. However, where the two tracks fall within the paved working area at the cranes they are laid with 128-lb RE girder rail. Because these rails precluded the necessity of providing flangeways in the concrete their use was said to result in savings in both materials and installation time.

Two crossovers located in an area covered with bituminous paving include several different types of special trackwork. The switches in these crossovers are of the solid manganese tongue-and-mate type. They were selected instead of split switches to facilitate the movement of rubber-tired vehicles over the trackwork without danger of damage.

Other features of the crossovers, which have No. 7 turnouts, include the use of 128-lb RE girder guard rails opposite the frogs and on the insides of curves, and 128-lb RE girder rails on the outsides of curves. The girder guard rail has a heavier flangeway wall than regular girder rail and, therefore, acts as a guard rail when used opposite frogs and on curves. Switches in the two crossovers are operated by parallel-throw switch stands.

All of the trackwork installed at the terminal was engineered, detailed and fabricated at the Steelton (Pa.) plant of the Bethlehem Steel Company.



KEY FEATURE of the mobile painting outfit is the elevating working platform with a maximum height of 15 ft 9 in above street level.

Paints bridges with mobile rig

Use of truck-mounted elevating platform by North Western in Chicago area cuts 70 per cent from time required to paint structures over streets.

● An all-in-one, mobile painting outfit has been developed by the North Western for painting bridges across streets in Chicago and vicinity.

"Bridge painting time has been cut 70 per cent with this rig," says M. S. Reid, the road's assistant chief engineer—maintenance. Two men can now paint an entire bridge in less time than six could in the past." Speed and convenience, he explains, are enhanced by the fact that it is no longer necessary to transport and handle ladders and scaffolding.

Basis of the outfit is a Chevrolet stake-body truck. Mounted on the truck bed immediately behind the cab is a hydraulic lift and work platform

which can be raised to a height of 15 ft 9 in above the street level. At its lowest position the platform is 6 ft above the street.

The platform affords an 8-ft by 4-ft working area. However, side extensions are provided that give an additional 3 ft at each end, increasing the maximum working length to 14 ft.

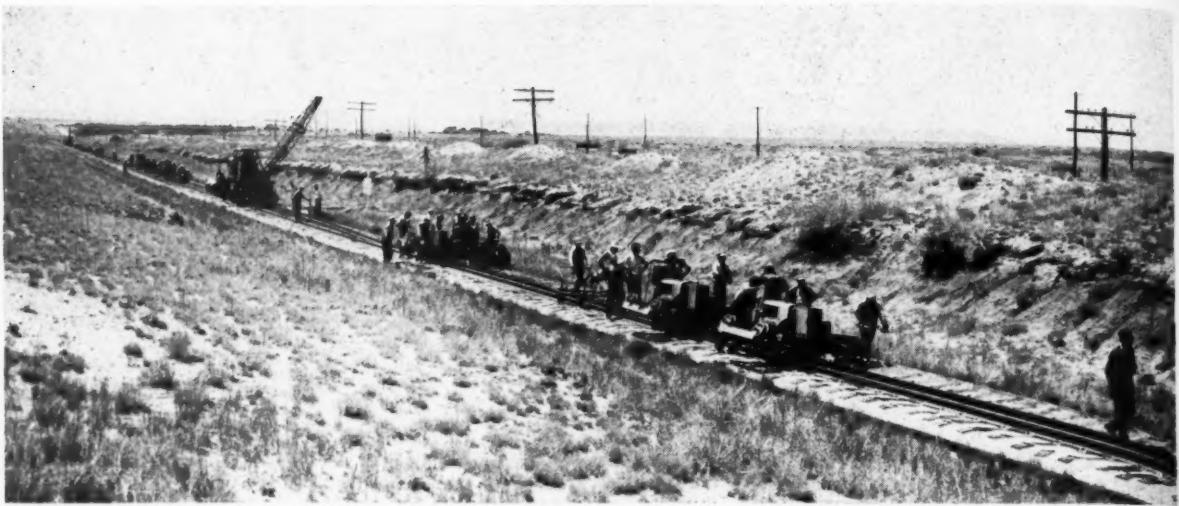
Painting equipment provided on the outfit consists of two Binks Model 18 spray guns and an auxiliary pole gun 4 ft long for extra high work, plus the necessary pumps, hoses, compressors and accessories.

The pump is in an air-operated reciprocating-type unit. It receives its working pressure from the truck-

mounted compressor which is driven by a gasoline engine. Air pressure at the spray nozzle is maintained at 30 psi, but can, of course, be varied. Other equipment includes the necessary regulators, respirators, and an agitator for constant mixing of the paint in the material drum.

The coating material used by the North Western is of the type that has the consistency of toothpaste in the stored state. In cool weather the material is heated immediately before application to a semi-paste fluid by an electric drum heater which is also mounted on the truck.

"Since per-job costs are lower, we can also spot paint bridges more often than before," says Mr. Reid. "Not only does this prolong the life of our facilities, but it presents a much better picture of the railroad to the general public."



WELDED RAIL being laid on the Rock Island near Tucumcari, N.M. The strings were transported 1100 miles from welding plant in Chicago.

How RI lays long welded rails



During the 1959 working season the Rock Island laid about 40 track-miles of continuous welded rail. For handling the long rails in the field the road used a rubber-tired crane with front and rear guide wheels. Average daily performance: 10 quarter-mile strings.

CRANE, operating on old rail on one side, new rail on the other (left), used tongs to set new rail on tie plates. View below shows crane setting long rail on ties between rails ahead of laying operation.

● This year the Rock Island was faced with the problem of laying a considerable amount of continuous welded rail. Before the season came to an end the road had laid approximately 40 track-miles of such rail, all consisting of the 119-lb CF&I section welded into strings 1323 ft long.

All the butt-welding work was done at the Matisa Railweld plant in Chicago. Some of the rail was laid in track as far away as Tucumcari, N. M., about 1100 miles from Chicago. For hauling the rail it was loaded on strings of cars equipped to carry 30 lengths placed in three tiers of 10 each. The long rails were securely anchored at the center against longitudinal movement, and a gondola partially filled with sand was placed at each end as an additional safeguard. No problems were encountered in the transportation of the long rails.

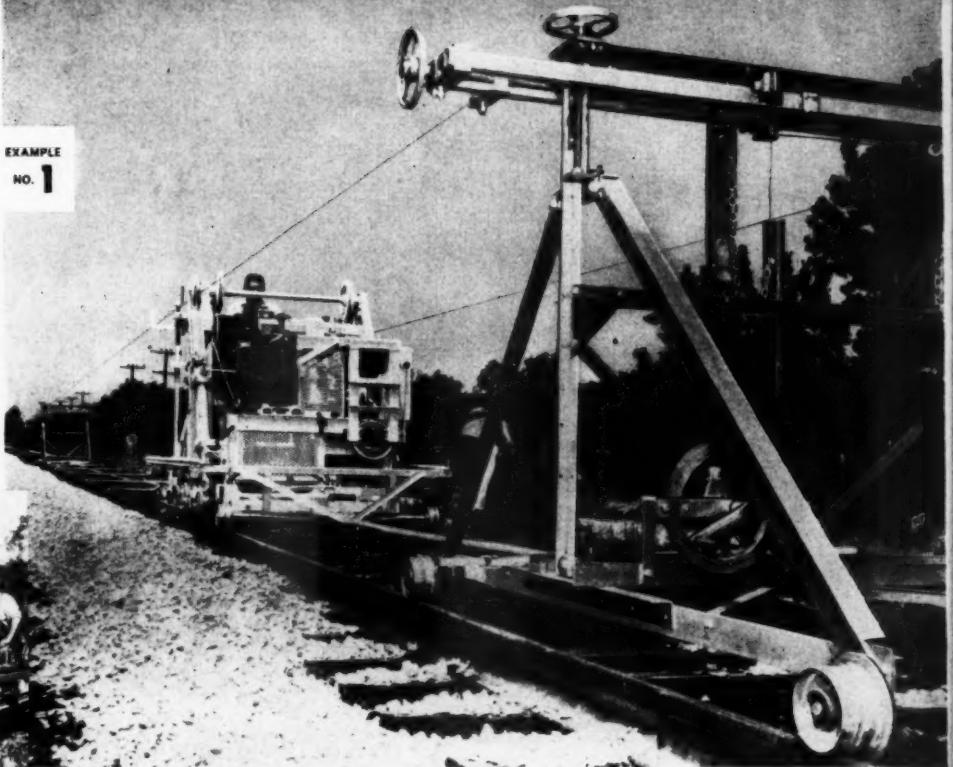
Using threaders and a trailing
(Continued on page 52)



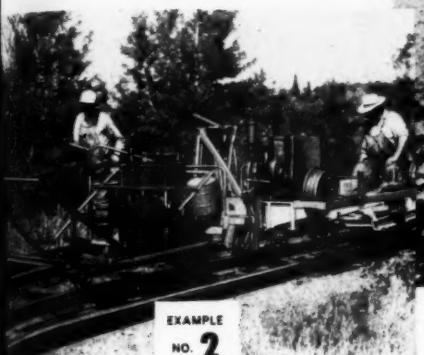
SURFACING OPERATIONS

The Nordberg Tamping Power Jack and Trak-Surfacer team raises track, tamps ties to hold the raise, and provides propulsion power. The Trak-Surfacer uses a stretched wire to form a reference line for the top of the grade rail. Following right after, the Gang Tamper tamps all ties. Then the Trakliner® and Line Indicator line tangent and curve track.

EXAMPLE
NO. 1



EXAMPLE
NO. 2



RELAYING OPERATIONS

The Dun-Rite® Gaging Machine and Bronco is the key machine, used with these other Nordberg units: Power Wrench, Self-Propelled Spike Puller, Ballast Router, Self-Propelled Adzing Machine, Rail Drill, Tie Drill and Spike Hammer, for completely mechanized relaying operations.



EXAMPLE
NO. 3

TIE RENEWAL OPERATIONS

The Nordberg Gandy® is one of the important machines used for reducing tie renewal costs. This efficient unit is used to pull out old ties, insert new ties, pile or load old ties, set machines on or off the track, and distribute new ties. Other Nordberg machines for tie renewal include the Hydraulic Spike Puller and Carriage, Tie Drill and Spike Hammer.

N.M.C.O.



ORGANIZED MECHANIZATION with NORDBERG MECHANICAL MUSCLES will give you maximum maintenance economy

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R658-R



Winter arrives ahead of schedule

Blazing switch heaters along tracks of the Milwaukee Road in Chicago, where four inches of snow fell and temperatures dropped to three degrees above zero, signify a return of winter weather.

Trouble is it wasn't winter yet; it wasn't even the middle of November. Winter wasn't due officially for another month. Chicago was lucky, however. In Montana blizzards had already dumped up to two feet or more of snow on the ground and temperature had plunged to far below zero.

(Chicago Tribune photo)



Crane lifts crane on bridge job

A 10-ton truck crane is lifted by a 125-ton crane to the top level of the triple-deck bridge which the United States Steel Division is erecting as part of Chicago's Northwest Expressway. Smaller crane will be used to install steel floor plates in C&NW bridge on this level.

New bridge for relocated line

The Great Northern recently placed in service a new three-span deck-plate girder bridge over the Entiat river near Entiat, Wash. Replacing a truss span (foreground), it is situated on a 24-mile section of the Wenatchee-Oroville branch line which has been relocated due to construction of the Rocky Reach dam on the Columbia river near Wenatchee. Dam will raise water level 78 ft, flooding the old bridge site. The 120-ft long girders weigh 68 tons each and were fabricated by the Bethlehem Steel Company.

News briefs in pictures . . .





Extends to 100-ft height . . .

Aerial lift

THE MODEL TAL 7075 Turret Derrick is now available equipped with a three-stage telescoping boom which, it is said, can be extended to a height of 100 ft. Designated the "Super" series, the completely hydraulically operated lift is mounted on the Truco pedestal and is stated to have a capacity of 500 lb when the boom is horizontal and fully extended. The unit is designed to be mounted in 14 in of space on a standard truck chassis directly behind the cab, leaving the remainder of the chassis free for use with any type of service body. The boom is claimed to rotate through 360 deg and to have a "retractomatic" hinge base which permits compactness and low storage height.

Stability of the machine is provided by four hydraulically operated jacklegs located at the four corners of the chassis and by outriggers which have a span of 16 ft. The boom can be equipped with a two-man fiberglass basket or 4-ft by 6-ft aluminum platform. Other equipment available includes flanged wheels, a 15,000-lb winch which converts the lift into a turret derrick, and a 50-hp Truco turret digger attachment for boring holes up to 30 in. in diameter. *Truck Equipment Company, Dept. RTS, 3963 Walnut St., Denver 5, Colo.*

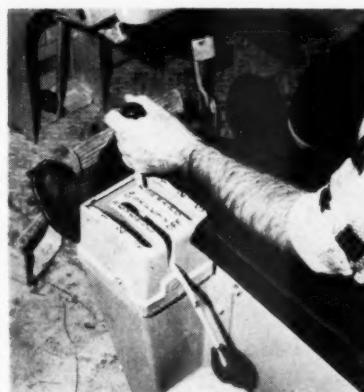
*
Aids machine repairs . . .

Maintenance sets

THREE new hydraulic maintenance sets are available. The manufacturer states that the sets can be used to accomplish many repair jobs, including the removal and installation of gears, bearings, bearing cups,

wheels, sheaves, shafts, couplings, sprockets and pulleys. The sets are said to be equally adaptable to all types of machines, such as fractional-horsepower motors, light machine tools, large earthmoving equipment and other heavy industrial machinery.

The No. Y-1700 set is manufactured for small and medium-sized equipment and has a capacity of 17½ tons. It contains a 17½-ton ram, pump, pullers and appropriate attachments. The No. Y-1730 set has a capacity of 30 tons and includes all of the components found in the 17½-ton set plus a 30-ton ram and attachments. The No. Y-1735 set has a capacity of 50 tons and is claimed to be able to handle a large percentage of all pulling jobs. This set incorporates all of the components of the lighter-capacity sets and, in addition, includes a 50-ton ram, special pump and attachments. *Owatonna Tool Company, Dept. RTS, 682 Cedar St., Owatonna, Minn.*



Power shifting for . . .

Crawler tractors

GEAR SHIFTING on Caterpillar D8 and D9 tractors can now be accomplished smoothly and without interruption of power and momentum, it is claimed. This is stated to be achieved without clutching by a new power shift transmission that is operated by a single lever (shown in picture) located on a pedestal to the left of the operator. The single range-selection lever replaces the flywheel clutch lever, gear selection lever and forward-reverse lever. The manufacturer states that tractors equipped with the new transmission can be shifted on the move under full load, then instantly reversed to a high return speed to begin another work cycle. In addition, the operator can instantly shift down under increasing load, then, without losing speed or power, shift up to optimum load speed for drifting up to the fill.

Heart of the new arrangement is a planetary gear set that is driven integrally by the engine flywheel. The gear set is designed to transmit one-third of the engine torque directly to the transmission input shaft. The

remaining torque is transmitted directly through the torque converter. The resulting tractor performance is said to combine the flexibility and anti-stall features of a torque converter drive with the operating snap of direct drive.

The power shift transmission is said to provide the operator with three speeds in both forward and reverse. It consists of five in-line gear trains, each with a separate clutch. Two of the gear trains are directional with the other three constituting the low, intermediate and high ranges. The clutches are controlled by a direct-acting hydraulic system which is designed so that shifting first engages the speed-range clutches, followed by engagement of the forward or reverse clutches. This feature is claimed to assure smooth operation when changing speed ranges.

Safety features include a lever on the selector-lever pedestal which locks the selector lever in place when it is in the neutral position. Another safety feature is a hydraulic safety valve which automatically shifts the transmission into neutral when the engine is stopped. *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.*



New container for . . .

Starting fluid

IDENTIFICATION of Spray Starting Fluid can now be made more readily, it is stated, since the adoption of a new pressurized container. The new container is white with orange lettering replacing the former orange-colored can. As a further aid to identification the "balky donkey," which is part of the Spray brand trade mark, appears in orange against the white background.

Spray Starting Fluid in a pressurized can was introduced in January 1956. It is claimed to spray in temperatures down to 65 deg below zero. It is said that all the propellant burns so that none of the contents of the can is wasted. *Spray Products Corporation, Dept. RTS, Camden 1, N.J.*

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Chicago
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Forty-foot wide Armco Building serves Great Northern as a warehouse.

Here's How Armco Buildings Work for the Great Northern

These pictures show some of the ways the Great Northern Railway puts Armco Steel Buildings to work. Notice the variety of size, function, and window and door arrangements that are possible with these buildings. All are achieved with standard parts and accessories. Write us for facts on how you can build better for less the Armco Way. Get details about the attractive, durable, heavy-gage panel wall construction that makes an Armco Building your best building investment. Armco Drainage & Metal Products, Inc., 7629 Curtis Street, Middletown, Ohio.

ARMCO BUILDINGS ARE SERVICE-TESTED



Comfortable, neat, easy-to-maintain Armco Building functions as a motor car house and lineman's building.

New steels are
born at
Armco



This 12' x 14'-8" portable depot at Grasston, Minnesota, is a typical example of the Great Northern's use of small Armco Buildings.

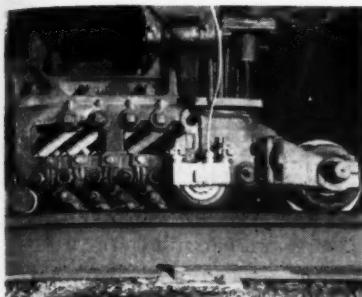
ARMCO DRAINAGE & METAL PRODUCTS



Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
The Armco International Corporation • Union Wire Rope Corporation

Products (cont'd)



Ultrasonics now used by . . .

Detector cars

TRANSVERSE DEFECTS in rail heads can now be detected throughout the entire length of the rail, including the joint areas, it is claimed, by the use of ultrasonic testing equipment which is being installed on the Sperry fleet of detector cars. It is stated that with the new equipment small defects existing on the surface of the rail can readily be screened out so that more serious defects can be distinguished.

The new system is made up of three major components: The transducer wheels, the detector control center and the tape recorder. The transducer wheels are mounted at the rear of the main brush carriages. The sound is coupled into the rail by means of a film of water which is applied as part of the standard test procedure. The detection control center contains the ultrasonic instrumentation for scanning and monitoring the rail. It provides visual set-up indication on a cathode-ray tube and selects signals of predetermined amplitude from pre-set gated areas. The information is then monitored for the tape recorder where it is recorded on the tape by one pen which deflects right for indicating right rail defects and left for left rail defects. *Sperry Products, Inc., Dept. RTS, Danbury, Conn.*

For weeds and brush . . .

New herbicide

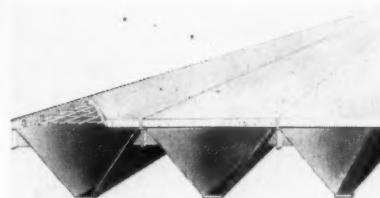
AVAILABLE in both liquid and granular forms, a new herbicide is claimed to be effective against deep-rooted weeds, including trumpet vine, briars, cattails, and Canada thistle; weed trees, including scrub oak, wild hickory, sassafras and poison oak; and all types of brush. Named "Urab," the material is designed for use in non-crop areas and to be soluble in water.

The new herbicide has a toxic killing ingredient consisting of 3-phenyl-1, 1-dimethylurea trichloroacetate, and is stated to have the special attribute of penetrating soil as readily as the water in which it is dissolved. The effectiveness of Urab is stated to be due to its solubility characteristic since once it is sprayed or spread on the soil it is carried down into the deep root zone by rain water. For this reason the material is claimed to work best at times when adequate rainfall is available, although it is also said that it will remain in the soil

through months of dry weather, ready to act whenever there is enough rain to make it effective. Due to this feature, Urab is claimed to become most effective at times when weeds, trees and brush grow most vigorously. It is stated that an application of $\frac{1}{4}$ to $\frac{1}{2}$ cup of liquid Urab or $\frac{1}{4}$ to $\frac{1}{2}$ lb of granular Urab will control an infested area of 100 sq ft. *Allied Chemical Company, General Chemical Division, Dept. RTS, 61 Broadway, New York 6.*

The new grinder is supported on a carriage which has insulated wheels. The grinding unit slides along the carriage for positioning over either rail. Handle-bar grips are provided for the use of the operator when moving the machine forward and backward along the rail during the grinding operation. In addition, the grinding unit can be adjusted from side to side in its carriage assembly.

Two 16-in rubber-tired wheels are provided on one end to permit one man to remove the machine from the track. However, the grinder is designed so that the grinding head can be detached from the frame and each part lifted off the track separately. Provision has been made for the attachment of a flexible shaft to the engine for powering a rail slotter or other accessory equipment. *National Cylinder Gas Division, Chemetron Corporation, Dept. RTS, 4700 West 19th St., Chicago.*



Fast erection claimed for . . .

Triangular girder

A COMPOSITE girder is available which is fabricated in the shape of a triangle with a reinforced-concrete top flange and structural steel webs and bottom flange. The manufacturer states that the new girder, which is prefabricated ready for erection, has many advantages in the construction of roofs, floors and bridge decks where long spans are required.

The concrete slab forming the top flange is claimed to be watertight and to develop a fiber stress of 3000 psi at 28 days. It is poured, vibrated, cured and finished in the shop under controlled conditions. The girders are designed for a wide variety of loadings. The manufacturer also points out that the girders effectively conceal utilities when used for floor and ceiling construction. *Shlagro Steel Products Corporation, Dept. RTS, 84 Washington St., Somerville 43, Mass.*



Features tractor drive . . .

Salt, sand spreader

ONE MAN operates the new Gravely self-propelled Salt-N-Sand Spreader when deicing platforms, walks and streets. The unit is equipped with an 11-cu ft hopper that is stated to hold 1500 lb of sand or 600 lb of salt, calcium chloride, granular fertilizer, lime, or any combination of these materials. The spreader is designed to mechanically spread material from 4 ft to 25 ft in width and eliminates hand shoveling and spreading. The manufacturer states that the machine will spread a single load of sand over an area 25 ft wide by 1050 ft long.

The new spreader is powered by a 6.6-hp Gravely tractor and is 36 in wide, 48 in long and 35 in high. The carriage is constructed of welded structural steel and operates on dual-rubber-tired rear wheels and rubber-tired casters, the latter being located at the front of the carriage. The casters are equipped with heavy-duty, Timken bearings. The hopper of the unit is constructed of 16-gage reinforced steel and is designed to be attached to the carriage frame without the use of tools. It has ports and side-throw flaps, both controlled by the operator, and is equipped with a power vibrator. All controls are stated to be located at the operator's fingertips for maximum efficiency. *Gravely Tractor, Inc., Dept RTS, Dunbar, W.Va.*



Abrasive belt used on . . .

Rail grinder

A PORTABLE machine for surface grinding rails, which utilizes a continuous abrasive belt as the grinding medium is now available. The 24-grit belt is 4 in wide by 106-in long and is mounted on rollers in a triangular frame which surrounds the 4-cycle air-cooled gasoline engine. Contact with the work is provided by a removable wheel which is formed of flexible material, having a hardness of 85 durometers, to enable the moving belt to shape itself to the contour of the rail head.

Heating wayside buildings

What is the most economical method of heating small two- or three-room wayside buildings? Explain.

Prefers electrical heat

By E. U. GOGL
Bridge and Building Supervisor
Southern Pacific
Portland, Ore.

Naturally, cost is the main factor to be considered. In the Northwest, wood is abundant and, in years past, was the main fuel used for heating. However, while wood did a good job of heating, it has been harder and harder to obtain in sufficient quantities because of the shortage of labor for cutting and handling. This makes the cost for heating with wood excessive.

Heating with coal in the Northwest is out of the question because of the cost of this fuel and of storing and handling it.

Many companies have gone to oil heat. But, in my opinion, the cost of oil is also excessive because of the handling and storage problems.

Gas, either natural or manufactured, is possibly among the cheaper fuels and does a very good job of heating.

Here in the West, with its abun-

dance of electrical power, I firmly believe the best, cheapest and safest way of heating is with electricity. Electrical heat is available in many forms. First of all, it is safe. Also it is clean, requires little or no space for installation and storage, no handling cost, and, a big factor, requires very little maintenance. Electrical heat is fast making itself desirable in most any kind of climate.

Unit heaters

By G. P. SMITH
Bridge and Building Supervisor
Northern Pacific
Missoula, Mont.

On our Rocky Mountain division, we find it very efficient and economical to heat small depots, service buildings, pump houses, car houses, etc., with natural gas and oil-burning space heaters. The larger service buildings are heated with unit gas heaters where natural gas is available.

In most of the roundhouses, we are

installing unit gas heaters ranging in capacity from 125,000 Btu to 200,000 Btu. We place these unit heaters 10 ft to 11 ft above the floor, and have very satisfactory results.

Hot-water system

By A. W. CRUIKSHANK
Plumbing & Heating Supervisor
Delaware & Hudson
Watervliet, N. Y.

In determining the type of heating for small wayside buildings, the first consideration is the occupants, and, second, the contents.

Assuming that the wayside building is a yard office with an office room, crews' locker room and a toilet room, the most desirable heating system would be a hot-water temperature-controlled system, either oil or gas-fired. Baseboard fin radiation should be used for an even distribution of heat and conservation of space. The system should be zoned with two circuits, one serving the radiation in the crews' room and toilet room, and the other the office room.

The water in the boiler should be temperature controlled and held in check by a flow-control valve until a thermostat in the zones calls for heat which would be circulated by a pump.

NEW QUESTIONS to be answered in March

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you'd prefer that your name be withheld, we'll gladly comply.

DEADLINE: January 29

- 1. Where frost has severely heaved a spot on the low rail of a curve, what is the proper corrective procedure? Should the ties be adzed? If the outer rail is to be shimmed, what precautions must be taken to prevent track spreading where high shims are necessary? How should these shim run-offs be made? Explain.

- 2. When driving a pile, what are the indications that the pile is brooming? Should driving be stopped? If not, what should be done? Explain.

- 3. When tamping track out-of-face, what measures can be taken to prevent damage either to the waterproofing membrane or the timber deck while working on ballasted-deck structures? Explain.

- 4. There are various types of paints, such as vinyls, alkyds, acrylic resins, bitumastics, etc., all highly recommended by their manufacturers for building exteriors. What are the relative advantages of each type? Explain.

- 5. If a bright young man were to ask your advice about whether or not he should adopt railroad maintenance-of-way work as a career, what would you tell him? Explain the reasons for your opinion.

Send answers to:

**What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois**

Do you have a question you'd like to have answered in these columns? If so, please send it in.

A system as described would maintain any desired temperature, resulting in low fuel cost, less upkeep and ease of operation.

Use natural gas

By J. W. PORTER
Supervisor Bridges and Buildings
Great Northern
Minot, N. D.

There are several ways of heating small wayside buildings in this cold country of North Dakota and Montana. We are located where there are many new oil wells as well as many lignite coal mines in operation.

Up until a few years ago, we used lignite coal-burning equipment for most heating purposes. But, since it has become necessary for the railroads to curtail train service and reduce forces in all departments, it has also

become necessary to change the method of heating. We changed to oil-burning stoves and furnaces; also to gas equipment wherever it was available. In some instances electric strip heaters are used where it is only necessary to keep the temperature to about 35 to 40 deg in a small building.

In some of the zeolite water plants, we have both electric strip heaters and bottled-gas heat. The electric heaters are cut in by the thermostat at 35 deg if the gas equipment should fail. The gas equipment keeps a heat of about 45 deg. This method is used to keep a required temperature against freezing weather. In this location bottled gas is cheaper than electric heat, so gas is used rather than electricity.

Where oil-burning stoves are used, it is found that No. 1 oil, or a good grade of oil, should be used for better service as this oil does not soot up the stoves when burning on a low setting.

Also, it does not congeal at very low temperatures. A storage tank of about 600-gal capacity is used. It is placed where it can be serviced by a local dealer who has a contract with the railroad company for furnishing oil.

Our service foreman has a panel truck and the necessary parts to take care of this equipment. He makes inspections as often as he can to keep the stoves in good condition.

Natural gas is economical but as yet it is not available generally. Gas is being piped from the oil fields now and will soon be easily obtained.

We convert about 10 buildings a year from coal to either gas- or oil-burning equipment as we find this is the most economical heat.

To sum it up, natural gas is the cheapest method of heating where available. If gas cannot be obtained, oil-burning equipment proves quite satisfactory.

Pointing timber piles

Should a timber pile be pointed for driving? Why? Should it be square-pointed or round-pointed? How long should the point be made? Should the pointing be done in the field or at the treating plant? Explain.

More accurate driving

By J. A. ROSE
Bridge and Building Master
Canadian Pacific
Montreal, Que.

All piles should be pointed for good driving. Why? For better control of the pile and easier driving.

Should piles be square-pointed or round-pointed? We never make them actually round pointed. We use square or six-sided points, depending on the type of ground into which they are being driven. The length of point also depends on the soil conditions. In soft soil a short point works well. But in hard ground a 10-in or 12-in point is required to do a good job.

The pointing should be done in the field. I have had a lot of experience in driving and supervising the driving of piles for culvert work, bridge work, and timber retaining walls. In deciding on the point, the pile should first be rolled and examined to get the shape of the pile. The point is then put on in line with the contour of the pile.

If the pile is crooked, the point should be shaped to conform with the curve of the pile. This helps when starting the pile in the required position. If the point is not correct, and the pile is being driven in boulders or coarse gravel, it will lead away from the line of driving.

In my opinion pointing is very necessary. If a pointed pile hits a boulder while driving, it has a better chance of pushing the object aside or glancing past it. A blunt-end pile would be stopped on a boulder and, if driving is continued, it could possibly be broken.

Easier driving

By R. F. COPELAND
Master Carpenter
Chicago, Burlington & Quincy
Casper, Wyo.

Yes, I think a timber pile should be pointed for driving. My experience is that they drive easier and at some locations they may get more penetration. If they would happen to strike a

large rock, or something of that nature, they would drive around it much better, with not so many chances of brooming the end.

I think they should be square pointed about 4 in square, with the point 8 in to 10 in long, depending on the diameter of the pile. I do not think it makes much difference whether the pointing is made in the field or at the treating plant. Account of having several feet penetration, air would not have a chance to enter the point to deteriorate it after being driven in a bridge. The piling could be pointed in the field or at the treating plant.

Better penetration

By T. W. TOAL
Master Carpenter
Chicago, Rock Island & Pacific
Des Moines, Iowa

The pointing of a timber pile will be determined by the type of earth formation into which it is being driven. If it is known that the pile will rest on a rock stratum, the pile should not be pointed, as the brooming of the tip of the pile, due to driving or repeated applications of live load, will commence much quicker if the pile is pointed because of the smaller support area.

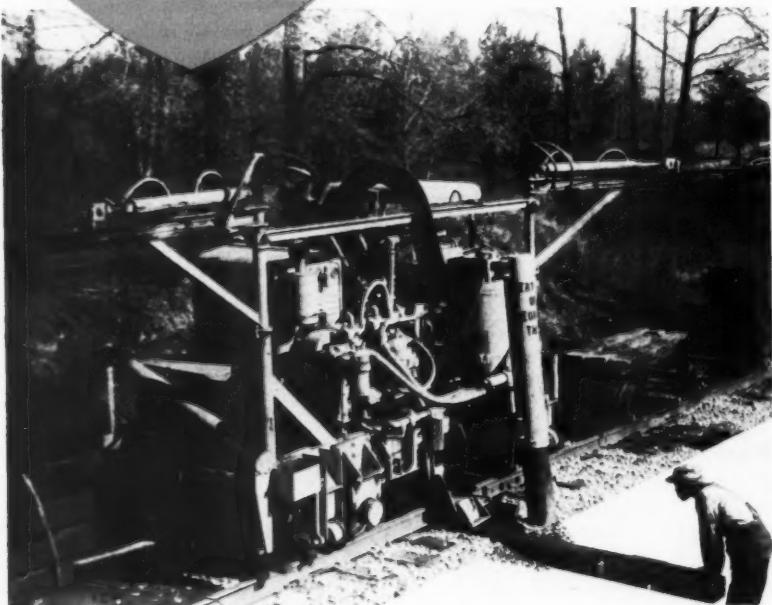
If rock is not in the picture, and the earth is ordinary clay, sand or gravel,

HOW TO REPLACE TIES *economically*

*...with minimum disturbance
to the track*



TieMaster does the complete tie replacement job, using only an operator and two laborers to attain speeds of better than one tie per minute. Only the TieMaster does all essential tie replacement steps—lifting the rails enough to clear tie plates, removing old tie, scarifying the bed, and inserting new tie. *Bulletin T-55.*



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tenance machines
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Car Repair Sys-
tem

What's the answer? (cont'd)

we prefer to square point the pile and leave a square, blunt area at the tip about 5 in square. We feel that slightly better penetration is achieved by pointing.

The length of the point should be approximately 9 in and we follow the practice of pointing in the field. However, I can think of no objections to pointing the pile at the treating plant; better treatment would result if the pointing were done before treatment.

Several factors

By C. L. TANNER
General Foreman B&B & WS
Panhandle & Santa Fe
Slaton, Tex.

A timber pile should be pointed for driving: (1) To keep the edges from slivering off in many soil formations; (2) to speed the rate of penetration; (3) to prevent embedment of gravel and loose rock in the flat end with resultant damage from splitting; and (4) to provide a better guide of the driving axis, which is, to a large extent, insurance against the pile drifting out of line while being driven.

In uniformly smooth soils, where end bearing may be desirable, very little trimming of the point is necessary to prevent slivering. It has also been observed that in tight soils subject to high compaction the driven face of the timber forms its own point of compacted material. Cones of compacted caliche 20 in. in length have been excavated below the 10-in faces of oak piles.

The cones were of rock-like hardness. The composition and color of the material indicated they were formed full size and shape, immediately upon entry of the flat face of the timber into the substantial material. Shear lines in the material surrounding the cones in their final position were plainly evident. It was apparent that, once formed, the compressed conical point preceded the timber to its ultimate penetration.

It is apparent from observations that the rate of penetration is slowed by the size of the point face, as well as by the angle of slope of the point. Thus, the time element used in driving enters into the need for pointing. But perhaps more important is the driving

force required for the blunter points. To obtain the desired penetration, prolonged use of the hammer unduly punishes the timber and may result in extensive damage to it and to the hammer as well.

The writer has recovered piles with gravel and shale embedded in the points and faces. He has found piles split by coarse gravel and loose rock acting as edges in a flat point. These are conditions under which light welded protective metal points are worth the cost.

It is too costly to shape round points in the field. Therefore, piles should be conically pointed by machine at the treating plant with the same precision used in dapping track ties. They should be sharpened to a fine point. The tip of the point should be carefully positioned in the driving axis of the timber. If a blunt point is wanted, the fine point may be quickly and cheaply lopped off in the field to the desired face diameter.

The angle of the point should be as flat as practicable and should range from 15 to 25 deg with the vertical. The natural angle formed in driving by a flat point is about 14 deg.

Soil conditions a factor

By S. R. THURMAN
Bridge and Building Supervisor
Missouri Pacific
Nevada, Mo.

There has been a lot of talk concerning the pointing of timber piles for driving. There are several things to be taken into consideration. The most important one is the type of earth the piles will encounter while driving. In places where you have several feet of dirt over bedrock and no rock mixed in with it, the piles will drive and stay in line better when not pointed, provided the end of the pile is cut square as it soon forms a point of hard-packed earth that acts as a guide.

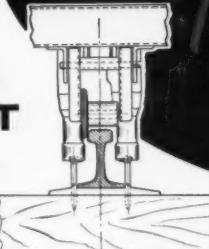
In other places where there is a formation of dirt, mostly clay mixed with rocks from 1 in to 8 in. in diameter, it is better to point the piles and place a metal point on them. This prevents the piles from becoming damaged if they should strike the rocks.

The shape of the points on piles is governed either from personal choice or the shape of the metal points on the pile. The square point is more easily made and is more effective in helping

SPEED:
*Up to 8 Ties
per minute!*



**Now... with
AUTOMATIC
ADJUSTMENT
for track gauge
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More effective now than ever—SpikeMaster is equipped with a Swinging Gun Mount which automatically adjusts for variations in rail gauge. Air cylinders keep flanged pilot wheels tight to the rail gauge, enabling swinging head to position guns positively over spikes—regardless of curvature or gauge inequalities.

SpikeMaster nips up the tie and drives four spikes—one on either side of both rails.

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Railway Maintenance Corporation

PITTSBURGH 30, PA.



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What's the answer? (cont'd)

to control the driving of the pile. The pointing must be done by an experienced man. It should be done in the field as each formation requires a different point to assure that the pile will be driven straight.

The length of the point should be not more than one and one-half the diameter of the pile. The point should be left 3 or 4 in square and not brought to a sharp point. Care must be exercised when driving to refusal, especially in shallow driving, so as not to damage the point of the pile and start it brooming.

Only for rocky formations

By LELAND HUOT
Pile Driver Engineer
Spokane, Portland & Seattle
Portland, Ore.

Under normal driving conditions I see no reason for pointing piling. However, when a rocky formation is encountered, I believe the pile should be cut back approximately 18 in to expose untreated wood. Then, it should be round pointed for a length of 1½ times the pile diameter. Leave ½ of the diameter unpointed to about 1/3 of the diameter on large piling. We have had very good results in almost all types of difficult penetration with this point.

I hope some one does answer the question of square or round points. I have seen many oldtimers square-point piling. It may be of some advantage when drop hammers were used, I do not know.

I can see no advantage in pointing piling at the plant. Besides, a treated point breaks and brooms easier than then method we use.

(More on page 46)

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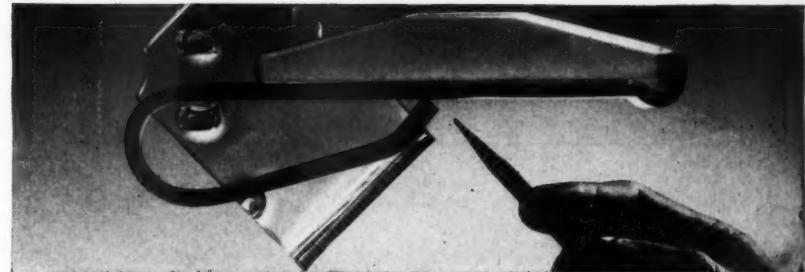
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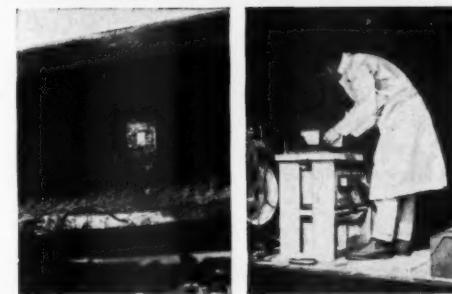
Buy tie protection. Deep tie-bearing surface transmits load over a wide, flat area to avoid tie damage. It doesn't bear on tie plate, so can't damage tie through spike disturbance.



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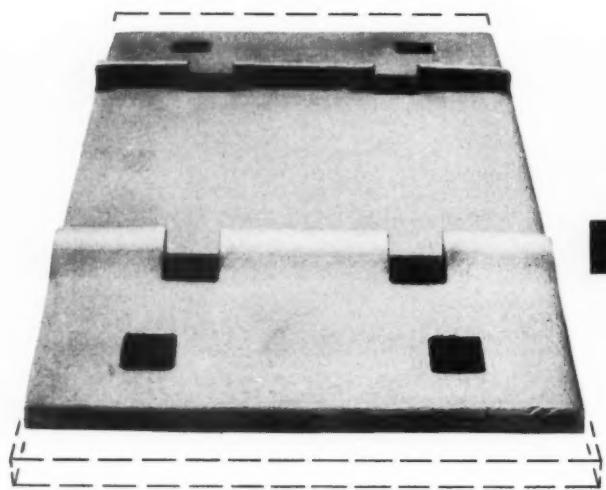
Buy reapplication. BULLDOG anchors can be reapplied again and again, or applied to worn rail . . . with no loss of holding power. That's because the original application doesn't weaken them.



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YOU CAN LOOK TO  FOR LEADERSHIP



(SMALLER TIE PLATES)



(RACOR TIE PADS)

Here's how you can save \$1,320 or more on every mile of track re-laid

Are you short of funds for M/W upgrading? If your present rail relaying plans call for larger tie plates, we urge you to seriously consider using your *present* plates with Racor® tie pads. You will get far better tie protection, and you will save money, too. New large quantity discounts on top-quality Racor tie pads now make out-of-face installations economically sound. The accompanying table shows how big some of these savings can be!

Do you have usable tie plates on hand? If you have a stock of smaller tie plates which you have "outgrown", you can upgrade them by several sizes through the use of Racor tie pads.

As the A.R.E.A. test at London, Kentucky, shows, small tie plates *plus* proper tie pad protection equal longer tie life, elimination of plate cutting, and far lower track maintenance costs. Experience indicates that a reduction of one, two or even three inches in plate size may be practical under many conditions. Thus it is often possible to effect very substantial savings while realizing

the many benefits of Racor tie pad protection.

Do you want to reduce future M/W expenses? The new low quantity prices on Racor tie pads now make out-of-face installation of tie pads economically feasible in a great many heavy traffic main line locations. In an effort to reduce plate cutting and the resulting higher costs for maintaining main line track in top condition, many roads are considering larger or heavier tie plates. By providing better tie protection and lower maintenance requirements, Racor tie pads at their new low prices provide a more economical alternative.

To help you take full advantage of these new quantity prices on Racor tie pads, your American Brake Shoe representative will be glad to go over your situation with you and prepare a comprehensive cost analysis for your evaluation. For full details consult American Brake Shoe Company, Railroad Products Division, 530 Fifth Avenue, New York 36, New York.



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WITH 115 POUND RAIL:

USING THIS SIZE TIE PLATE AND RACOR TIE PAD	INSTEAD OF THIS SIZE TIE PLATE ALONE	SAVES YOU THIS MUCH PER MILE
No. 4 11" Light	No. 7 13" Heavy	\$1,320
No. 4 11" Light	No. 8 14" Ex. Hvy.	2,795
No. 4 11" Light	No. 20 15" Heavy	4,795
No. 6 12" Medium	No. 7 13" Heavy	40
No. 6 12" Medium	No. 8 14" Ex. Hvy.	1,510
No. 6 12" Medium	No. 20 15" Heavy	3,490
No. 7 13" Heavy	No. 20 15" Heavy	1,793
No. 8 14" Ex. Hvy.	No. 20 15" Heavy	193

WITH 132 OR 133 POUND RAIL:

USING THIS SIZE TIE PLATE AND RACOR TIE PAD	INSTEAD OF THIS SIZE TIE PLATE ALONE	SAVES YOU THIS MUCH PER MILE
No. 9 12" Light	No. 12 14" Heavy	\$1,360
No. 9 12" Light	No. 13 14½" Ex. Hvy.	2,260
No. 9 12" Light	No. 21 16" Heavy	4,965
No. 10 13" Medium	No. 13 14½" Ex. Hvy.	843
No. 10 13" Medium	No. 21 16" Heavy	3,543
No. 11 13" Medium	No. 13 14½" Ex. Hvy.	593
No. 11 13" Medium	No. 21 16" Heavy	3,293
No. 12 14" Heavy	No. 21 16" Heavy	1,813

* Tie pad prices based on quantities required for ten miles of track. Tie plate prices F.O.B. mill for 7½" sizes.



Quality products cut your ton-mile costs



A-2989

What's the answer? (cont'd)

Tamping ties with production tampers

Can crossties be tamped too solidly with production tampers? If so, what is the effect on the ties and riding qualities of the track? Does the density of traffic or the

speed of trains make any difference? Explain.

Set number of strokes

By C. M. SPYRES
Roadmaster
Kansas City Southern
Shreveport, La.

I have had limited experience with the production tamper but I would say that this machine can tamp ties too

solidly. In using this machine a standard should be set as to number of strokes to be made by the tamper so as to perform a uniform job. It is important that the cushion provided by the roadbed be as nearly uniform as possible.

If the production tamper is allowed to pack spots too solidly the weight of trains is distributed unevenly. This, in turn, causes undue wear of the ties and a bumpy riding condition. These cause a loss in line and surface.

Better riding qualities

However, the production tamper is of great advantage if operated uniformly at each tie. Making about three strokes at each tie gives about the right cushion for the track. Also, it helps to maintain line and surface, and I feel that the track has better riding qualities.

Density of traffic and speed of trains has little effect on a track properly tamped with the production tamper. However, on a track not uniformly tamped, solid spots cause loss of riding quality, excessive wear on ties and loss of line and surface to some extent. This makes it necessary to rework the track in a relatively short time.

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Switch point-
Closed position locked

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This Switch Point Lock is a self-contained unit, ruggedly constructed and simple in design and operation. It is automatic in its closing and locking action.

To operate the switch point lock, put foot on lever and push down — then operate switch stand lever in usual manner to throw or open switch. To close switch, operate switch stand lever or pedal in the usual way and the device automatically returns to its normal or locked position. This Automatic Switch Point lock deserves your immediate investigation — as a proved safety device for your road.

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Makes a choppy ride

By V. D. KERNS
Roadmaster
Western Pacific
Keddie, Calif.

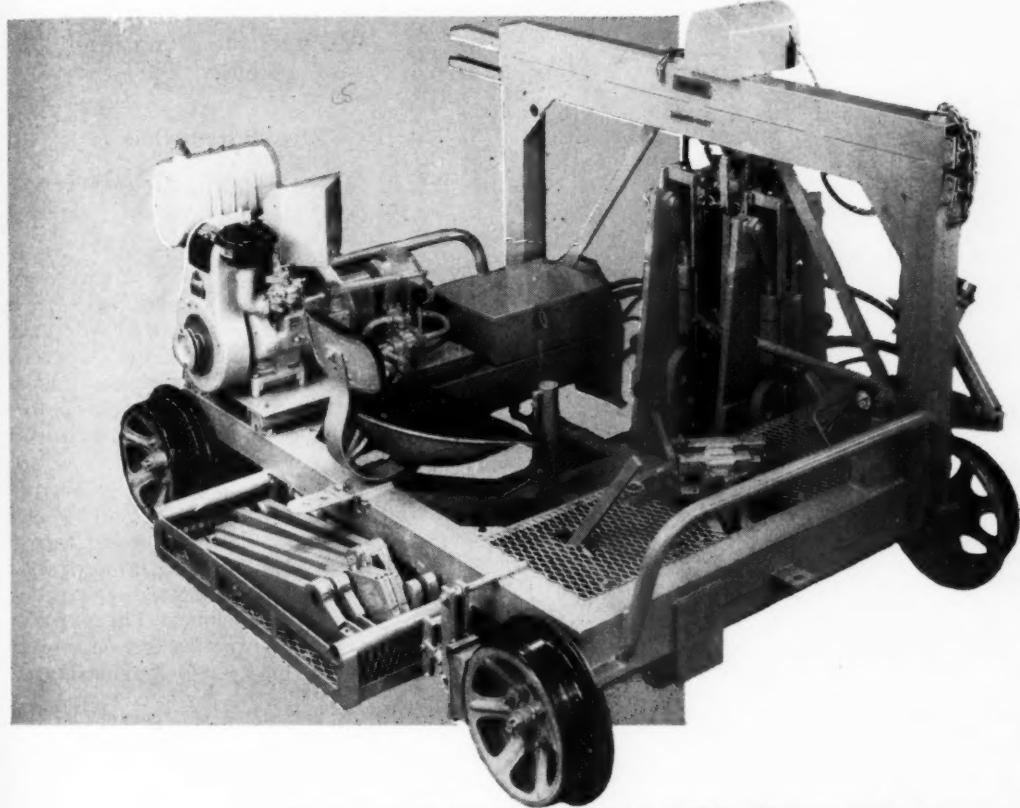
Crossties can be tamped too solidly with production tampers. To overcome this when making tie renewals where tie pads are used, we place the tie pad on the tie before tamping. After being tamped, the plate is placed on top of the pad, so that the tie only has to settle the thickness of the plate. If this is too much, we place the inside edge of the tie plate under the base of the rail until tamped, which is $\frac{1}{2}$ the thickness of entire plate. After the tie is tamped, we then place the plate properly and spike it. The compactness of ballast can be regulated by varying the number of strokes delivered by the tamper.

If ties are tamped too solidly and the plates put on, the ties are higher and more solid. Under high-speed traffic, the track will ride very choppy.

(More on page 48)

RACINE

Hydraulically operated
"Anchor Fast" ANCHOR APPLICATOR



For applying ALL TYPES of drive-on or tool applied hang-on anchors

The only machine, of its kind, in the field. The "Anchor-Fast" is hydraulically controlled and self-propelled. Maximum speed 15 mph. Unit is powered by a hydraulic jack cylinder for "off track" movement or can be revolved 180° for work on opposite rail.

CONSTRUCTION AND OPERATION FEATURES

- Smooth hydraulic pressure with adjustable stops, prevents over driving.
- Positive anchor-to-tie application.
- Machine can be used for either single or box anchoring.
- Powered by a 9.2 hp gas engine with clutch and reduction gear.
- Size of unit—95" x 75" x 56". Wgt. 2300 lbs.



RACINE HYDRAULICS & MACHINERY, INC.
Machinery Division

Racine, Wisconsin



Go-anywhere tractor speeds maintenance, cuts traffic delays

L-W Tournatractor® speeds dozing, pulling, pushing tasks anywhere. Rubber-tired mobility lets you drive on highways or right-of-way; handle work on, off, or across tracks. You eliminate work-train service, main-line delays, because operator simply gets on and drives to next assignment at a moment's notice. This speeds service, saves time.

Stays clear of traffic

Because 17.2 mph L-W Tournatractor gets out of the way fast, it does not tie up rail traffic while cleaning drainage ditches or landslides, cutting down banks, spreading cinders, ballast, preparing grade crossings, etc. It requires no work train, no train crew, no loading and unloading delays. Operator simply drives out to the job, cleans up the dirt to be moved, goes on to the next assignment immediately.

Your regular maintenance-of-way crew can become competent operators in a short time. All work functions are handled by electric motors.

Will not damage system

Big rubber tires of L-W Tournatractor roll over tracks without damage. You don't have to worry about bent rails, chamfered ties, inoperative switches where this machine is working. Nor do you need planking to drive this tractor over soft, slippery, or shifting materials.

Tows, pushes, switches

Besides doing heavy-duty dozing on your right-of-way, Tournatractor can aid other machinery—it tows and operates other wheeled work units, push-loads self-propelled scrapers. If you choose L-W's coupler-equipped model, called SwitchTractor†, for your work, it can also provide off-track emergency car switching service as desired.

Get complete information

Before you buy any tractor, it will pay you to get all the facts from LeTourneau-Westinghouse on high-speed, rubber-tired Tournatractor.

†Trademark CT-1891-RR-2/3

LETOURNEAU-WESTINGHOUSE COMPANY



Railroad Sales Division
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company
Where quality is a habit



What's the answer? (cont'd)

Protecting roadway machines at night

What is the most effective method for protecting small roadway machines and power tools from weather and vandals when it is more convenient and less costly to leave them setting at the work site along the right of way? Explain.

Cover with tarpaulins

By G. R. COLLIER
Chief Engineer
Gulf, Colorado & Santa Fe
Galveston, Tex.

We do not provide extensive protection for our roadway machines on this grand division. They are usually covered with tarpaulins to protect them from the weather—at least the portions are covered that may be damaged, such as engines and other components.

The only vandalism we have encountered was on a gang working within the limits of one of our larger cities. Here we found it necessary to post a night watchman for the protection of the equipment. The gang cleared the city within a few days so this was the most economical handling.

Chain units together

By W. C. MACCORMICK
General Roadmaster
Seaboard Air Line
Jacksonville, Fla.

When small machines and power tools are left along the right of way they should be grouped in a place clear of grass or other combustible matter. Also, a chain should be run through the handles or other openings to lock groups together. This makes it inconvenient to carry away a small piece or part. It appears that any means of locking is at least some protection.

A waterproof canvas, of proper size, should be spread over the group and fastened down. Make sure that some room is left between the cover and groundline to give ample ventilation,

(Continued on page 52)



SPENO

Here are the up-to-date facts on the SPENO Ballast Cleaning and the SPENO Rail Grinding Services.

BALLAST CLEANING

SPENO Engineering and Research has developed a superior screening arrangement so that we are now using an improved Ballast Cleaner with greater efficiency.

RAIL GRINDING

Our Rail Grinding Service has been so well received we are now building a *THIRD* Rail Grinding Train to take care of the increased demand.

SPENO is constantly developing means for better service to make sure that the Railroads receive everything they pay for — and more



Just Ask the Railroads That have used us!



FRANK SPENO RAILROAD BALLAST CLEANING CO., INC.

Clark Street
East Syracuse, N. Y.

306 North Cayuga St.
Ithaca, N. Y.



NEW CAT DW20 4-wheel, 345 HP Series G Tractor
with 24 cu. yd. No. 482 Scraper



NEW CAT DW21 2-wheel, 345 HP Series G Tractor
with 19.5 cu. yd. No. 470 Scraper



NEW CAT No. 619 2-wheel, 225 HP Series B Tractor
with 14 cu. yd. No. 442 Scraper

BIG NEW CAT WHEEL RIGS CUT PRODUCTION COSTS

You name the job...these new Cat Wheel Tractors and matching LOWBOWL Scrapers can do it better with faster cycles and greater production, at lower cost. For example:

DW20-DW21 Series G Tractors and matching LOWBOWL Scrapers Now these big wheel tractors develop 345 HP—an increase of 8% over former units. Both tractors have 12% more rimpull than before—the DW20 develops 39,565 lb. (maximum) rimpull, and the DW21 has 49,100 lb. (maximum) rimpull. As a result, the new rigs travel faster (up to 20%) under similar haul road conditions. To accommodate this greater power and capacity, improvements have also been made in transmission and final drive.

Matching the increased horsepower and productivity of the Series G Wheel Tractors are the new No. 456 and No. 470 Series B LOWBOWL Scrapers. Rating is increased 8% to 19.5 cu. yd. struck and 27 cu. yd. heaped. (Rating on the No. 482 is 24 cu. yd. struck and 34 cu. yd. heaped.) Bowl, draft frame and apron are strengthened for greater resistance to tough materials and rugged loading—withstand higher loading stresses.

No. 619 Series B Wheel Tractor and No. 442 Series B LOWBOWL Scraper Here is the latest addition to the Caterpillar line of high-speed earthmoving equipment. This brand-new earthmover is a 14 cu. yd. struck (18 cu. yd. heaped) unit featuring ground-hugging roadability, "years ahead" service-accessibility, and high productivity. The No. 619 has a turbocharged 225 HP

engine (and high torque rise), planetary final drives, unit construction, tubeless tires, a swing-away dash, 2-jack steering, and a dry-type air cleaner, providing the design and performance features that insure superior workability on a broad range of applications. All this in the new No. 619-No. 442 unit—plus proved economy over any earthmover of comparable size.

DW15 Series F Wheel Tractor and No. 428 LOWBOWL Scraper Greater strength and productivity in the well-known four-wheel DW15-No. 428. Bevel gear and pinion, differential and front wheel spindles offer increased service life. Machine delivers 200 HP. The big LOWBOWL Scraper handles 13 cu. yd. struck, 18 cu. yd. heaped. Can be unhitched to haul other units.

Plan your work around these new Cat Wheel Rigs for top production at lowest cost: The DW20-DW21 Series G, the new No. 619 and the DW15 Series F. The complete facts are at your Caterpillar Dealer. Call him today for a demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

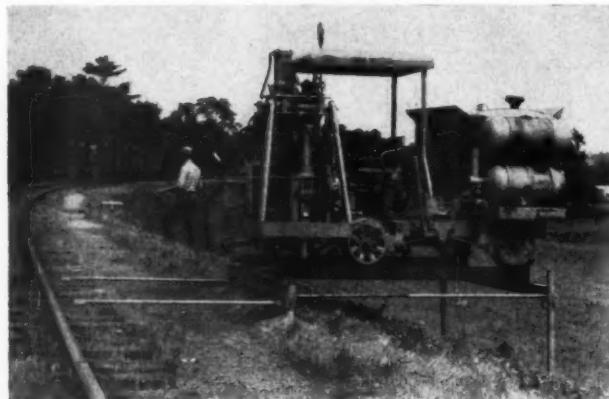
CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BORN OF RESEARCH
PROVED IN THE FIELD

TPC SET-OFFS

Patent Applied For



What's the answer?

(Continued from page 48)

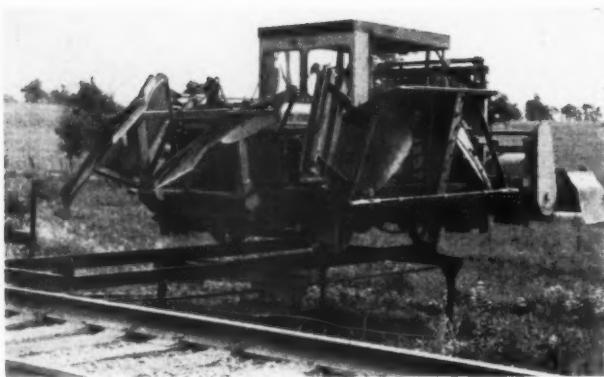
since great danger of fire is present if hot motors are covered up tightly.

It is advisable to group the equipment away from road crossings as well as on the roadbed opposite from roads, streets, etc.

There is greater danger of vandalism in cities, towns and thickly populated areas. Often some protection can be obtained by advising the railroad company police when and where the equipment is being left. Through their contacts with local law enforcement officers some protection may be realized.

When vandalism does occur, all reasonable effort should be made to bring the guilty persons to justice. This will tend to discourage others.

UNIVERSAL



AND CUSTOM



Set-Offs for ALL Maintenance of way Machines

TRANSPORT PRODUCTS CORPORATION

3008 MAGAZINE ST.

LOUISVILLE, KY.

(Continued from page 32)

Laying welded rail

truck with outriggers the rails were unloaded two at a time and deposited alongside the track by pulling the cars out from under them. Prior to being placed in final position in the track the rails were shifted to a position between the rails.

For laying the long rails the track forces "borrowed" from the bridge department a rubber-tired crane equipped with dolly-guide wheels. This was one of six Schild Bantam "Rail-Roader" cranes that had been acquired specially for doing work on bridges.

In the rail-relay work the preliminary operations were performed in the usual manner. Mechanical spike pullers were used to pull the spikes on the side being relaid, after which the old rails were barred out to the side. The ties were then adzed and the tie plates placed and positioned with the aid of a pre-gager and a Dun-Rite gager.

The rubber-tired crane, operating on the old rail on one side and the new rail on the other, picked up the new rail and laid it on the new tie plates. In this operation the crane, using rail tongs, handled the welded rail in 25-ft increments, moving forward each time to take a new grip on the rail. Following behind the crane the new rail was machine spiked and rail anchors were applied to complete the job.

(More on page 54)

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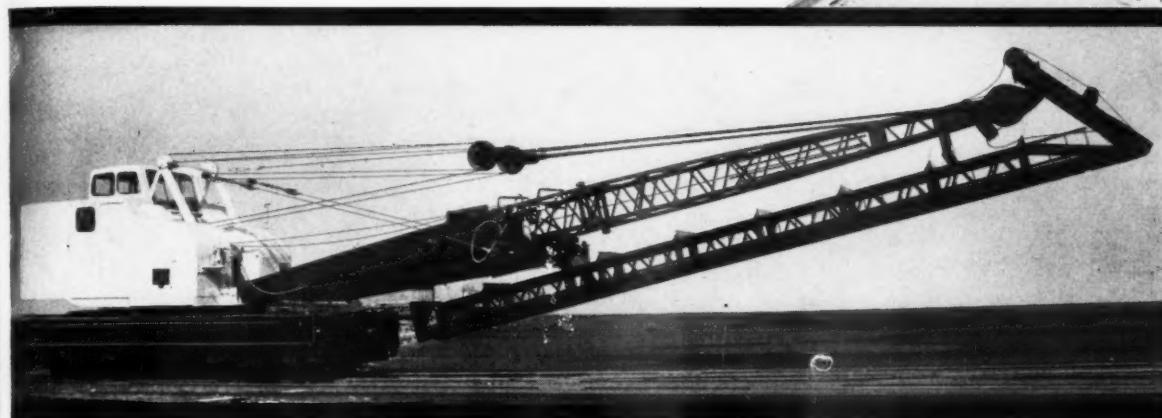
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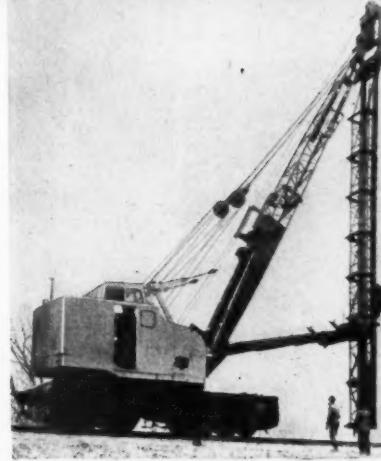
STRUCTURES

LATEST TYPE BROWNHOIST DIESEL ELECTRIC PILE DRIVER AT WORK FOR AMERICA'S RAILROADS



BROWNHOIST DIESEL ELECTRIC PILE DRIVERS HAVE THE SPEED
TO GET OFF MAIN LINES QUICKLY, AND THE LONG LEADERS AND
FULL CIRCLE ROTATION TO WORK IN ANY POSITION

Propelled by electric travel motors, these Industrial Brownhoist machines are capable of road speeds up to 18 miles per hour . . . they get on and off main lines in a hurry. Strut and leaders fold away for travel, allowing full railroad clearance, and they're quickly and easily fastened in upright position for battering. The Brownhoist rotates in a full circle, and its leader reach of 28'6" from center of rotation gives it a wide working range. A large Diesel engine supplies the power for the heavy-duty Brownhoist machine. It has a maximum leader load of 26,000 pounds, and is equipped with power battering to sink piles as large or larger than that shown in the upper photograph. For further information about Diesel Electric Pile Drivers or other heavy-duty materials handling equipment, write today for your copy of the new Industrial Brownhoist catalog.



189

BROWNHOIST

BROWNHOIST MATERIALS
HANDLING EQUIPMENT
GIVES A BIFF TO
AMERICAN INDUSTRY



RAILWAY TRACK and STRUCTURES

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN - DISTRICT OFFICES: New York,
Philadelphia, Cleveland, Chicago, San Francisco, Montreal
AGENCIES: Detroit, Birmingham, Houston

DECEMBER, 1959 53

Laying welded rail (cont'd)

During the rail-laying operation the forward motion of the crane, as well as the movements of the boom and boom line, were handled by an operator stationed in the crane cab. When necessary to clear for trains the crane was generally run to the nearest grade crossing and moved off the track on its rubber tires.

To make any longitudinal movements of the long rails required when joining them, a block and tackle was attached to the end of a rail length and run onto the drag drum of the crane, which operates independently of the hoist drum.

Using these methods, 19 track-miles of the welded rail were laid near Tucumcari in 15 working days. On the average the gang laid 10 of the long strings per day with about 5 hr of on-track time. "When things were going well we would lay one of the long strings in about 35 min," said H. G. Dennis, the RI's engineer M/W. The maximum amount laid in one day, he said, was 15,840 ft of rail.

During part of the rail-laying work the mobile crane was also used for placing the strings between the existing rails preparatory to laying them. In this work the rails were run through a threader hung from the boom line. For guiding the rails around the crane during this operation the manufacturer, collaborating with Rock Island engineers, developed a threader-type device for attachment to the rear outrigger box of the crane carrier. When a pilot model of this device was put into service it was found to serve satisfactorily as a means of helping to guide the rail through the threader on the boom line and eliminated the whipping and jumping of the rail against the side of the machine.

Olson subsequently served as relief section foreman, machine operator and extra gang foreman. He was promoted to roadmaster at Mobridge, S.D., in 1940, and was serving in that capacity at Lewistown, Mont., at the time of his recent promotion.

William M. Dowdy, 41, who was recently promoted to division engineer on the Chesapeake & Ohio at Clifton Forge, Va. (RT&S, July, p. 10), was born at Norfolk, Va., and received his higher education at the Virginia Polytechnic Institute. He entered railroad service with the C&O in 1946 as a rodman at Hinton, W. Va. Mr. Dowdy was promoted to assistant cost engineer at Richmond, Va., in 1952 and assistant track supervisor at Newport News, Va., two years later. He was further promoted to assistant division engineer at Columbus, Ohio, in 1955, the position he held at the time of his recent promotion.

Supply Trade News

Biographical Briefs

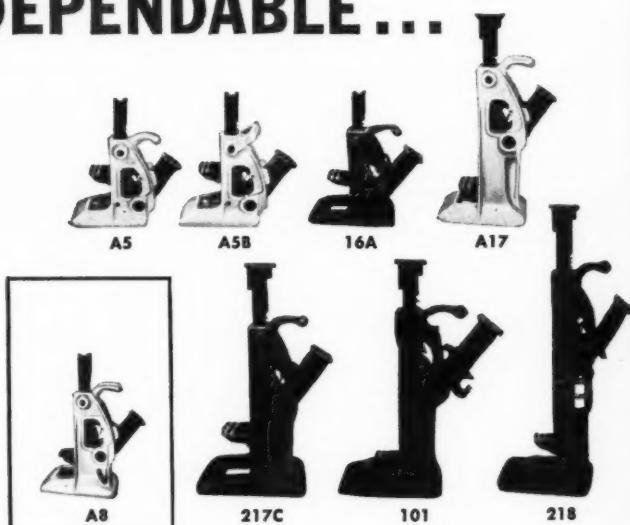
A. Myron Olson, 47, who was recently promoted to assistant general roadmaster on the Milwaukee Road at Chicago (RT&S, July, p. 10), was born at Horton, Mont. He entered the service of the Milwaukee in 1932 as a track laborer at Baker, Mont. Mr.

ACHUFF RAILWAY SUPPLY COMPANY—**T. C. Johnson**, of the **T. C. Johnson Company**, Chagrin Falls, Ohio, has been appointed district sales representative for Achuff Railway Supply Company, St. Louis, Mo., according to an announcement by **H. G. Rowe**, vice president of Achuff.

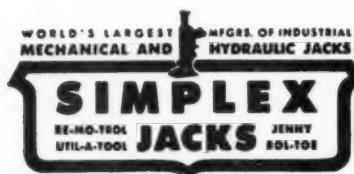
(More on page 56)

WORLD'S MOST DEPENDABLE... SIMPLEX TRACK JACKS

New Model No. A8, eliminates need for both high and low lift jacks. 15-ton capacity, 15 $\frac{1}{8}$ " high with 7 $\frac{3}{4}$ " lift. The fulcrum center is 3" higher than 5" lift jacks. Has 2" min. toe-lift height, weighs only 34 lbs.



- Most complete line—14 models
- Available with malleable or aluminum alloy housings
- Large area (2 $\frac{1}{2}$ " x 3 $\frac{1}{4}$ ") lifting toe has non-slip grooves
- Lifting ranges from 5 inches to 19 inches
- Thumb guards and trips on both sides
- Lowest toe height—less digging or pounding to set jack



ALSO AVAILABLE—Rail Pullers and Expanders, Tie Spacers, Rail Dollies, Tie Removers and Replacers, Bridge Jacks, Jack Supports, Push and Pull Jacks, Steamboat Ratchets and a complete line of Hydraulic Jacks—Rams, Pumps (hand or powered), Pullers and Accessories.

TEMPLETON, KENLY & CO. • 2543 GARDNER RD. • BROADVIEW, ILLINOIS

of section
extra gang
padmaster
as serving
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(RT&S),
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G. Rowe,



NOW... SAVE UP TO 13,000

SPIKES PER MILE

*... reduce tie splitting
from excessive spiking*

GAGE LOCK SPIKES

Two Gage Lock Spikes to a plate do a better holding job than 4 cut spikes on tangents and light curves. Fewer spikes are driven — causing less tie damage and permitting a saving of nearly 13,000 spikes per mile. The Gage Lock Spike is a plate fastening as well as a rail spike. It has an indented throat, offset at the tie plate surface. Result: thrust and wear are avoided from the edge of the rail base.

TIE PLATE LOCK SPIKES

Both the Tie Plate Lock Spike and the Gage Lock Spike hold the rail to gage and avoid plate cutting. When driven to refusal, the spread shank is compressed and binds against the walls of the hole with spring pressure. Play is eliminated — plates are held against movement — rail is held to gage and plate cutting is avoided.

RAIL LOCK SPIKES

Rail Lock Spikes offer the same design as Gage Lock Spikes, but are not offset at the plate surface. The throat protrudes $1/16"$ — resultant pressure binds the spike against the rail base edge. Play is eliminated between the tie plate shoulders — the rail is held to a true gage.

Forward-looking management can extend the cycle of track structure by using Lock Spikes. One regaging operation costs more than the initial cost of installing Lock Spikes. Specify spikes having a low annual cost — Specify Lock Spikes.



GAGE
LOCK SPIKE



TIE PLATE
LOCK SPIKE

BERNUTH, LEMBCKE CO., INC.

420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

**Does work
of 6 men**

ROWCO
BRUSHKING

Rowco's portable power driven brushcutter is designed for rugged terrain . . . cleans out brush up to 4" in diameter at ground level. Safe, dependable . . . Rowco's BRUSHKING is a real worksaver. Write today for name of your distributor — Thousands in use. Literature for your asking.



GRASS TRIMMING
ATTACHMENT

ROWCO
MFG. CO., Inc.
EMERALD STREET
KEENE, NEW HAMPSHIRE

Please send complete information on the Rowco Brushking.

NAME _____
STREET & NO. _____
CITY & STATE _____

Supply trade news (cont'd)

CATERPILLAR TRACTOR COMPANY — This company has announced the consolidation of its domestic sales, parts, service and treasury operations, effective January 1960. Nineteen members of the company's Northwest and Southwest divisions, currently located at San Francisco, Cal., will be transferred to Peoria, Ill.

CHIPMAN CHEMICAL COMPANY, INC. — **W. H. Moyer**, president of this company, has announced the reorganization and decentralization of its Railroad division. The division has been divided into the Eastern Region under **I. W. Bales**, vice president at Bound Brook, N. J., and the Western Region under **B. J. Smith**, vice president at Portland, Ore. Each region has been subdivided into districts, each under the direction of a district manager as follows:

Eastern Region—Southeast district under **D. Boatright** at Bessemer, Ala.; Northeast district under **D. Kirk** at Bound Brook; Central district under **J. R. McCambridge** at Chicago; and Southwest district under **J. T. Sandberg** at Pasadena, Tex.

Western Region — California district under **D. A. Zanette** at Palo Alto, Cal., and Northwest district under **L. E. Harris** at Portland, Ore.

Mr. Moyer also announced the appointment of **R. A. Brown** and **John Degman** to the Central district sales staff. **Donald Horne** will continue as local representative at St. Paul, Minn.

COLORADO FUEL & IRON CORP. — **Kingdon B. Dietz**, assistant sales manager, New York district, has been promoted to sales manager of that district.

DEARBORN CHEMICAL COMPANY — **J. E. Clemens**, assistant advertising manager at Chicago, has been promoted to advertising manager there, succeeding **Howard W. Scammon** who has been appointed to the new position of distributor sales manager.

FAIRMONT RAILWAY MOTORS — **Owen Buscho**, sales representative at St. Louis, Mo., has been promoted to district manager there, succeeding **George F. Adams** whose death is announced elsewhere in this issue.

KOPPERS COMPANY — **Douglas Grymes, Jr.**, vice president and general manager of this company's Wood Preserving division, has announced the division of the Eastern district into the Southeastern and Northeastern districts. The Southeastern district comprises all plants, sales and procurement offices south of the Virginia - North Carolina line. The Northeastern district comprises all facilities north of this line.

At the same time Mr. Grymes announced the following appointments within the division: **R. H. Devine** as assistant to division general manager at Pittsburgh, Pa.; **T. J. McGinnis** as manager, Northeastern district at Newport, Del.; **W. M. Barnes** as manager, Southeastern district at Charleston, S. C.; and **W. F. Klug, Jr.**, as manager, Pittsburgh district at Pittsburgh.

MATISA EQUIPMENT CORP. — **Charles W. Plunkett**, operations manager of this company's subsidiary, Matisa Railweld, Inc., has been promoted to operations manager of the parent company. **John Segala**, de-

sign engineer, has been promoted to assistant to operations manager. **Parker Hills** has been appointed superintendent of Matisa Railweld.

NALCO CHEMICAL COMPANY — According to an announcement by **Herbert S. Johnson**, manager of this company's Industrial division, **John T. Burke**, area manager at Pittsburgh, Pa., has been promoted to product manager, coagulation chemical department, at Chicago, succeeding **James E. Starry** who has been promoted to district manager, Texas district, at Houston, Tex. Mr. Starry succeeds **W. H. Rodewald** who has been promoted to vice president and general manager of the company's subsidiary in Venezuela.

NATIONAL CYLINDER GAS — This company, a division of Chemetron Corporation, has announced the appointment of seven special sales representatives to handle sales of equipment and rail welding services to railroads. Representatives appointed are: **R. E. Bell Company**, St. Louis, Mo.; **Eastern Railway Supplies, Inc.**, New York; **Stan H. Haigh Company**, St. Paul, Minn.; **Donald J. Hogan & Co., Inc.**, Chicago; **Stanley H. Smith & Co., Inc.**, Cleveland, Ohio; **Southeastern Railway Supply, Inc.**, Arlington, Va.; and **Don N. Roddy & Co.**, Denver, Colo.

NORTHWESTERN MOTOR COMPANY — **Jasper A. Berlin** has been elected president of this company. Mr. Berlin was formerly executive vice president of the Chippewa Woolen Mills.

PULLMAN-STANDARD — **Harris Shane**, associate director of industrial relations, has

PILING specialists to the railroads

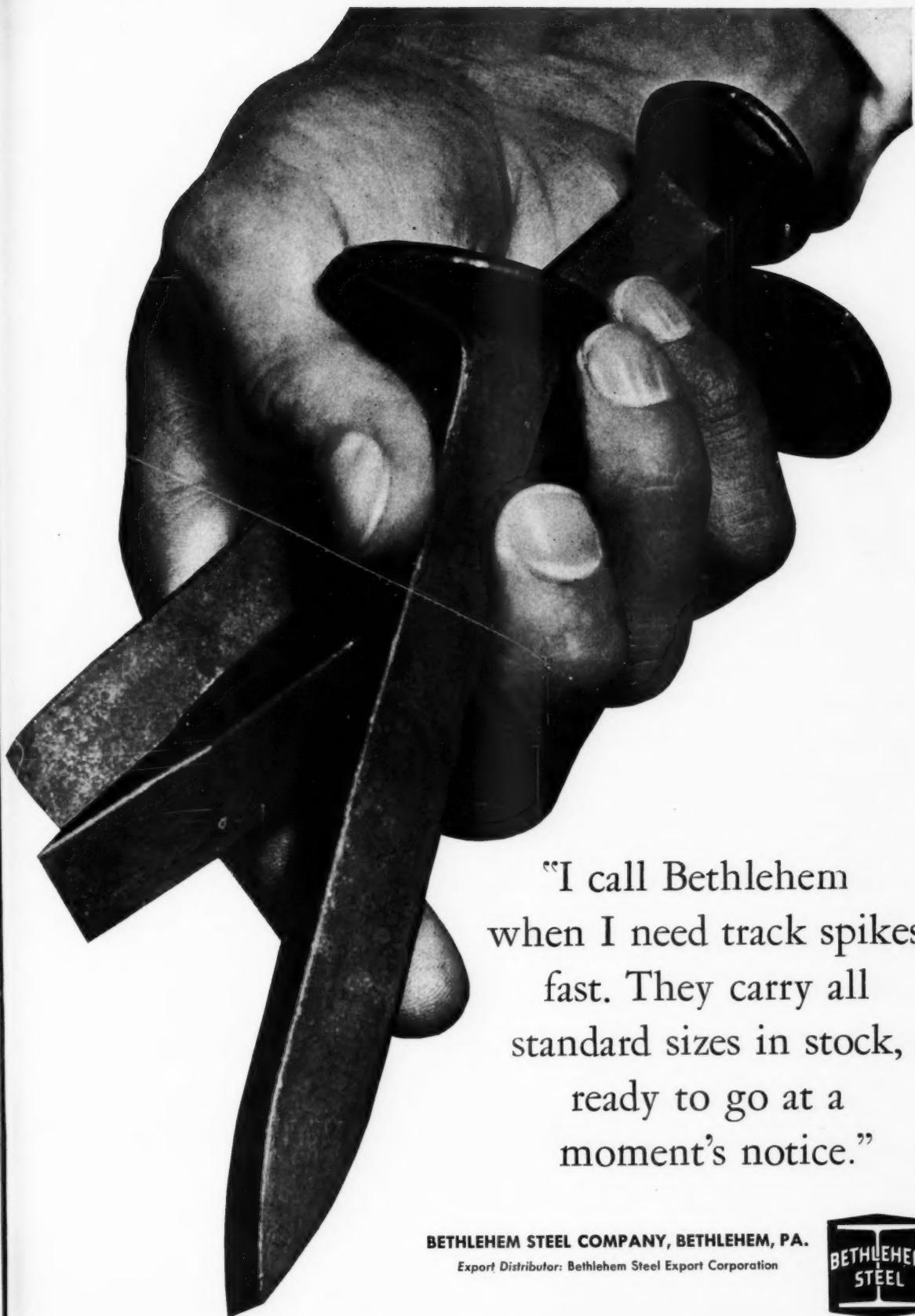


Steel-Sheet Piling
Foster Lightweight Piling
H-Bearing Pile • Pipe Pile
Construction Products

Take advantage of "Faster-from-Foster" service plus "single-source" buying for all your piling and construction needs. Get on-time deliveries from Foster's nationwide warehouse and field stocks.

Refer to our catalogs in Sweet's File
Rail • Switch Material • Track Accessories • Pipe

LB FOSTER CO.
PITTSBURGH 30 NEW YORK 7 CHICAGO 4
HOUSTON 2 LOS ANGELES 5 ATLANTA 8



"I call Bethlehem
when I need track spikes
fast. They carry all
standard sizes in stock,
ready to go at a
moment's notice."

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation



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STRUCTURES

MILWAY TRACK and STRUCTURES



Remington

ONE-MAN RAIL GRINDER

Attachments increase usefulness in surface, cross, switch-point and stock rail grinding plus maintenance shop work

Here's a versatile flexible-shaft grinding machine that can help you meet the challenge of rising costs. One man can roll it—one man can use it, and with attachments it's an all-purpose rail-grinding unit plus an all-round maintenance-shop grinder.

Remington's Model 23 Rail Grinder features a 9-hp, 4-cycle gasoline engine, wheelbarrow-mounted on a welded tubular-steel frame. It rolls easily over rough ground on a 20" pneumatic wheel or travels over the rails using a quickly attached outrigger. In addition, Remington offers its 2 $\frac{3}{4}$ -hp, Model 8 Signal Bond Grinder for on-the-road or shop use.

Remington tools can help you reduce maintenance costs. For free details mail the coupon or write Remington.

CHOOSE THE POWER MOST
EFFICIENT FOR YOU. REMINGTON
POWER TOOLS ARE AVAILABLE IN
**AIR • ELECTRIC • GASOLINE
AND POWDER ACTUATED
MODELS**

----- FREE POWER TOOL CATALOGS ----- RT-12

Remington Arms Company, Inc., Bridgeport 2, Conn.

Please send—without obligation—catalogs on Remington Contractor & Industrial Tools checked below:

- Rail Grinder Air Tools Flexible Shaft Machines Concrete Vibrators Chain Saws Stud Drivers

Name _____ Position _____

Company _____

Address _____

City _____ Zone _____ State _____

Supply trade news (cont'd)

been promoted to assistant vice president, industrial relations.

RAIL JOINT COMPANY—William R. Hamilton, Jr., who joined the Rail Joint Company in March 1958, has been appointed research engineer, according to an announcement by W. E. Gadd, vice president.

Obituary

George F. Adams, district manager for Fairmont Railway Motors, Inc., at St. Louis, Mo., died there on October 29.

Association News

Northwest Maintenance of Way Club

"Railroad Labor Relations" will be the subject of discussion at the December meeting of the club, which will be held on the 17th at Coleman's Cafe, 2239 Ford Parkway, St. Paul. The speaker will be C. A. Pearson, vice president personnel, Great Northern.

American Railway Engineering Association

At a meeting of the General Committee on Convention Arrangements held on November 5 at the Sherman Hotel, Chicago, the plans for carrying out the annual convention, to be held at the Sherman on March 14-16, 1960, were reviewed and finalized.

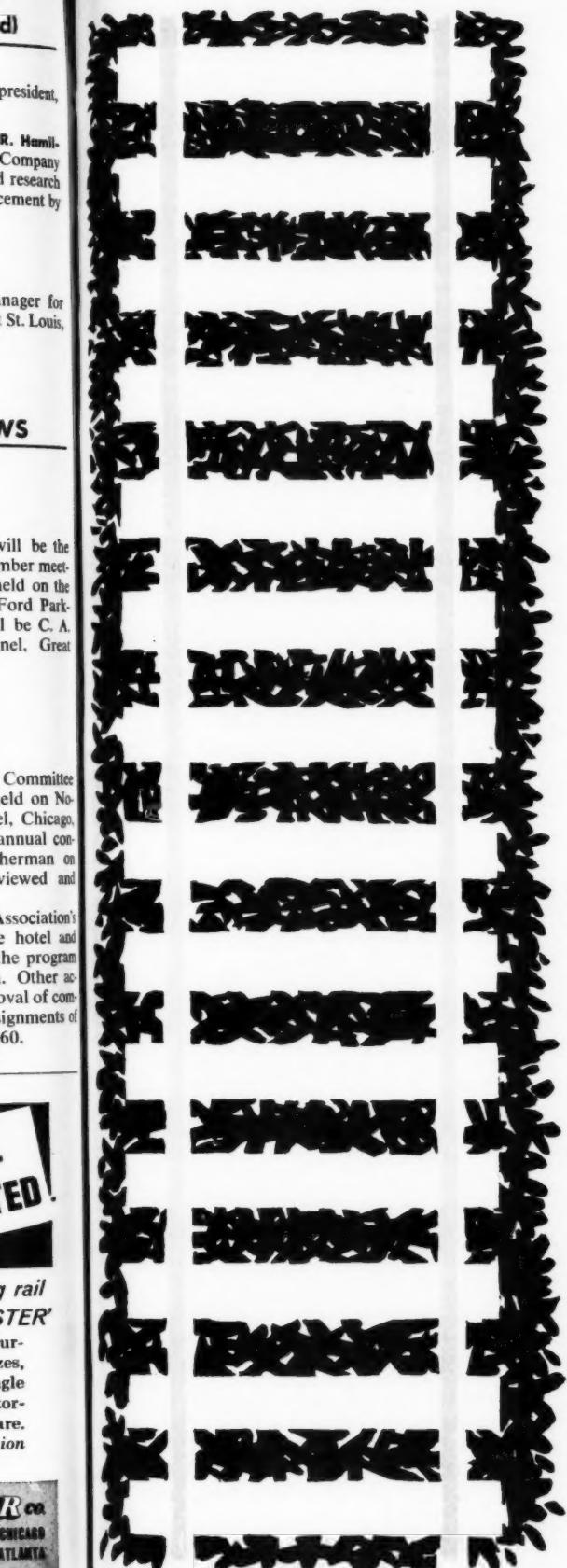
The following day the Association's Board of Direction met at the hotel and approved the general plan for the program and handling of the convention. Other action by the Board included approval of committee personnel and subject assignments of all technical committees for 1960.



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Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

RAIL WELDING. A 16-mm color and sound motion picture film is available which describes the Oxweld process of manufacturing continuous welded rail and explains its advantages. Entitled "Clear Board for Ribbonrail," the 24-min film explains the preparation and welding of both new and relay rail, the transportation of long rails and the sequence of operations involved in removing jointed rail and installing continuous welded rail. The film also shows the installation of the high-speed, welded rocket test track at Edwards Air Force Base, Cal. It will be loaned free to railroad personnel. (Write: Oxweld Railroad Service, Linde Company, Dept. RTS, 230 North Michigan Ave., Chicago 1, Ill.)

TRACK SURFACER. The Nordberg "Midget" Surfacer is described and illustrated in a new two-page bulletin. Designated 292, the bulletin explains how the unit is used to mechanically analyze the quality of track surface and for locating and correcting surface irregularities. In addition, the bulletin describes how management can set standards of quality for track surface. Illustrations include both close-up and general operating views. (Write: Nordberg Manufacturing Company, Dept. RTS, Milwaukee, Wis.)

CRAWLER TRACTOR. A new six-page brochure, Form 33544, is available which describes and illustrates the Caterpillar D9 Series E Tractor. The major improvements to the machine are explained, including new power shift transmission, increased horsepower, improved undercarriage, new hydraulic control and new equalizer-bar arrangement. Pictures are utilized to show each of the improved or new features. The power shift transmission is described and its operation is shown by means of a diagram. The brochure includes a set of condensed specifications. (Write: Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.)

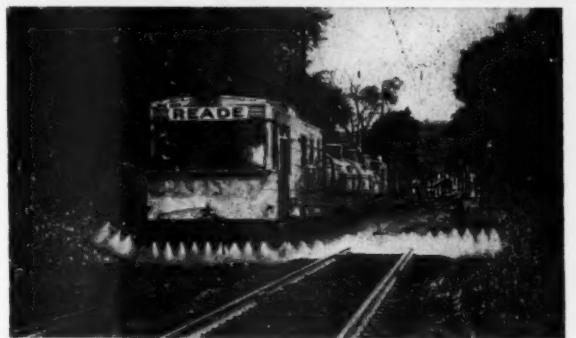
ELECTRIC PLANTS. The 1960 general catalog of Onan electric plants is now available. Designated F-146, the 2-color, 8-page catalog describes and illustrates both gasoline and diesel-engine-driven generator sets. Each series of plants is described in detail and specifications are given for both engine and generator. A chart of representative models within each specific series is included. The catalog also describes the new high capacity generating plants ranging up to 170,000 watts (gasoline) and 230,000 watts (diesel). Optional accessories available for use with each series are illustrated. (Write: D. W. Onan & Sons, Inc., Dept. RTS, 2515 University Ave., S.E., Minneapolis 14, Minn.)

DUMP UNITS. A new four-page folder is available which describes and illustrates Converto railroad dump units. Designated Circular 116, it points out the features of five models, including 1 and 2-cu yd units, two models of fast-dump units, and the newest "Hi-dump" unit. Brief specifications are given for each model. Also included are illustrations and brief descriptions of the Van-Packer Chimney, Hayco Lining Scope and Hayco shock-free head for bumping posts. (Write: The Brice Hayes Company, Dept. RTS, 6710 Northwest Highway, Chicago 31, Ill.)

EARTHMoving EQUIPMENT. A booklet is available which describes and illustrates the new Allis-Chalmers HD-21 crawler tractor. Designated Form MS-1243, the booklet points out the features of the machine and gives comprehensive specifications for its main elements. Pictures and cutaway drawings serve to illustrate the component parts of the tractor. A list of standard equipment is also included. Matched equipment and accessories available for use with the machine are illustrated. (Write: Allis-Chalmers Manufacturing Company, Construction Machinery Division, Dept. RTS, Milwaukee 1, Wis.)

TRUCK CRANE. A 12-page bulletin is available which describes and illustrates a new 30-ton Loraine Moto-Crane, Model MC-430. The bulletin uses pictures and drawings to show the features of the machine, such as carrier, turntable and crane boom. A number of on-the-job photographs are included. (Write: The Thew Shovel Company, Dept. RTS, Lorain, Ohio)

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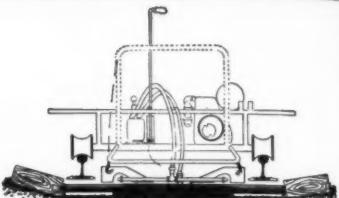
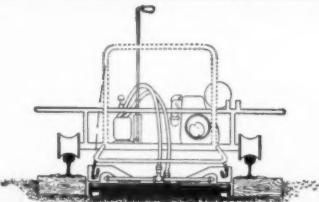
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